

Railway Age Gazette

DAILY EDITION

Vol. 48. NEW YORK—JUNE 15, 1910—ATLANTIC CITY. No. 23a.

PUBLISHED DAILY (eight times, June 15-June 23), BY
THE RAILROAD GAZETTE (INC.), 83 FULTON STREET, NEW YORK.CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.W. H. BOARDMAN, *President*.
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Subscription, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

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| United States and Mexico..... | \$5.00 a year. |
| Canada | \$6.00 a year. |
| Foreign Edition (London)..... | \$8.00 a year. |
| Single Copies | 15 cents each. |

Shop Edition and the eight M. C. B. and M. M. Convention Daily Issues, United States and Mexico, \$1.50; Canada, \$2.00; Foreign, \$3.00.

If mailed from Atlantic City the postage on this copy of the *Daily Railway Age Gazette* is seven cents. Unless the full amount is affixed to the wrapper or envelope, the post office will not forward the paper.

Application made at the Post Office at New York, N. Y., for entry as mail matter of the second class.

A good idea of the enormous brake power required for heavy passenger cars at high speeds may be gained by an inspection of the exhibition foundation brake rigging specially designed for that purpose. This equipment is as rugged as a bull-dozer and has all the attributes of an engine of destruction. The battery of 18-in. cylinders for heavy brake work in another group might be mistaken for the mortar guns used by General Grant at the siege of Vicksburg. The great weight of this brake rigging adds to the burden of non-paying equipment which is required to be hauled in trunk line express service. So long as railway managers place no limit on the weight of passenger car equipment, the tendency will be to continually increase it, and it is now so heavy that two large Pacific locomotives are required to maintain the schedule time. There must be a point reached where all this ceases to be profitable in any sense. To those who inspect the brake equipment above referred to, and which is regarded as necessary for present conditions, we submit the question, whether the sensible, economic, practical maximum limits of the weight of passenger equipment has not been reached and there should now be a movement tending to reduce this to some rational proportions.

Twenty years ago the Master Car Builders' convention was held at Old Point Comfort. William McWood was president, having served in that capacity for the two previous

years, 1888 and 1889. John W. Cloud began his first year as secretary of the association, and continued in that office nine years until 1899, when he was succeeded by the present secretary, Joseph W. Taylor. The active members then numbered 141, representative members 100, and associate members 6, a total of 247. Prominent among those taking an active part in the convention, but not now living, were F. D. Adams, J. N. Barr, B. K. Verbreyck, J. Townsend, R. C. Blackall and E. B. Wall. It is interesting to note that one of the principal reports related to "The Use of Pressed Steel and Malleable Iron in Car Construction," and that the only shop in this country with large presses for car work at that time was the Fox Pressed Steel Works at Joliet, Ill., which made nothing larger than the Fox flanged steel truck frame. The first exhibit of this truck was at Alexandria Bay in 1888. In 1890 Charles Schoen was making pressed steel stake pockets and center plates in his small shop in Philadelphia, but he had visions of larger things, and had designed a steel gondola weighing 18,000 pounds, which was illustrated in the *Railroad Gazette*, May 23, 1890. This was the beginning of that remarkable work in pressed steel car construction which Mr. Schoen carried on during the next ten years, and which has developed into such an enormous industry. The proceedings of the convention of 1890 are contained in a pamphlet one-half inch thick, and those of 1910 form a volume two inches thick, indicating that the amount of the material presented at the latter meeting in the way of reports and discussion was three or four times the amount presented at the convention of 1890. In each case the time required was three days, so that whatever complaint is now made over the deliberation in reading long reports can be met by the statement that the larger business of the association is now transacted and finished in the usual time appointed for the convention.

The experience of the American Street and Interurban Railway Association at its last two annual conventions probably has a lesson for the railway mechanical associations. The meetings of this association, having in view both the attendance and the size of the exhibits, are more nearly comparable to those of the mechanical associations than any others held in the country. In October, 1908, the Street and Interurban Railway Association met in Atlantic City. It was thought advisable to meet elsewhere last year, and it went to Denver. The auditorium there proved adequate for the exhibit, but the hotel accommodations were quite unsatisfactory. The hotels were so unequal to the demand that it was necessary to crowd about twice as many persons into each room as was compatible with comfort. This alone would have been bad enough. In addition, the hotel men raised their prices so that not only were there about twice as many people in a room as was consistent with comfort, but each had to pay about twice as much for accommodations as should have been asked even if satisfactory accommodations had been provided. The result is that in October, 1910, the Street and Interurban Railway Association will return to Atlantic City. We think of only two structures in the country, except at Atlantic City, where the large exhibit made by the Railway Supply Manufacturers' Association could be housed under a single roof. These are Convention Hall, at Kansas City, Mo.; and Madison Square Garden, at New York. But the hotel capacity at Kansas City is too small for the crowds that are drawn by the meetings of the mechanical associations; and while the hotel capacity of New York is, of course, the largest in the United States, the current demands on it always are so great that the hotel proprietors will not reserve so many rooms for an annual affair as are required for the meetings of the mechanical associations. The hotel capacity of Chicago is very large, and is growing fast, but there, as in New York,

the hotel proprietors are loath to reserve a large number of rooms, and, besides, the Coliseum would not be adequate for the Railway Supply Manufacturers' exhibit. All things considered, Atlantic City is unquestionably the best place in the country for the conventions of the mechanical associations; and so long as the Hotel Men's Association here deals fairly with them, the argument for continuing to come here will be very strong.

There used to be a saying, "Once a newspaper man, always a newspaper man." It is quite true now, but no more so than its paraphrase, "Once a railway man, always a railway man." In view of the frequent changes in railway service personnel, retirements from service for other reasons than because a pension is available, and the numerous recorded instances in which it is stated that "Mr. So-and-So has resigned to accept a position with"—some manufacturer of or dealer in railway supplies—this statement would, at first thought, seem to require some qualification; but it is at least more true than Voltaire was willing to admit any general statement to be. The fact is that in these days of specialization few men can claim to know it all in either the newspaper or the railway business, and perhaps to some extent both the terms "newspaper man" and "railway man" are misnomers; but there is no occasion for a quarrel about that. The point is that a man is a mechanical engineer by education or growth, a machinist or a locomotive engineman who has passed to a higher state of existence or the one in control of the operation and repair of the cars which he at first learned to build as something more than an ordinarily skillful carpenter. The men who rise to the highest positions simply become a little more really railway men than they were before. The publisher who now buys the kind of manuscript he used to hope to sell is perhaps in the same view the real newspaper man. But the man who continues as a mechanical engineer or a chemist, or what-not, is no less a mechanical engineer or a chemist because he works for a railway company. The late Charles E. Perkins, formerly president of the Chicago, Burlington & Quincy, once said: "I do not know what you mean by the education of a railway man. I suppose a railway lawyer is much the same as any other lawyer and a civil engineer employed by a railway does not thereby cease to be a civil engineer." The application of all this is that nearly every one of the class of men to whom these remarks are specially directed—the mechanical men—if he leaves the service of the railway by whom he has been employed, almost invariably finds his business and his social relations among the people who deal in the articles he is accustomed to use, and is confronted with the same problems with which he has been accustomed to struggle. He only grapples the problem from a little different standpoint. To return again to the illustration concerning the newspaper man, it matters little as to his general status and designation whether he is trying to produce manuscript that a publisher will buy, or whether he, as publisher, is trying to select for purchase such material as his public will read with joy and pay for with alacrity. On this basis, therefore, from a psychological standpoint and for the purposes of academic discussion, which is all that is intended here, we may return to our original conclusion—"Once a railway man, always a railway man."

CONSOLIDATION.

One of the most important subjects to be considered by the associations is that of "Consolidation." The committees on this subject were instructed to present the arguments both for and against consolidation. The main arguments in its

favor are that, excepting the legislative functions of the Master Car Builders' Association, the work of the two organizations is along the same lines and that their union would economize the time of those who do executive and committee work between conventions and of members attending the conventions. There are some arguments on the other side which we have heard advanced, and which merit consideration.

One of these is, that the union of the two associations and the holding of the convention of the consolidated organization in a single week probably would keep many from attending who are now able to attend the meeting of the one or the other association. This is because part of the mechanical officers of many roads, especially western lines, attend one of the conventions, and as soon as it adjourns go home to relieve the mechanical officers who have not attended the first convention, so as to enable them to attend the second. If there were only one convention it would last so short a time that only part of the officers of these roads would be able to attend. Furthermore, if the consolidated association should do all of its work in one week, it is probable that there would have to be several afternoon sessions; and this would so curtail the time available for members to inspect the exhibits that the value of the exhibit would be considerably impaired, and the incentive of the supply men to maintain it at its present high standard would be considerably reduced.

Some of the higher mechanical officers, particularly those on eastern roads, may, perhaps, reply that they could get along very well if there were no exhibits. But this view will not be shared by the majority of the members of the associations. Most of the members have little opportunity except at the time of the conventions to see and study the new devices being put on the market from year to year. If their opportunity to observe them at that time were reduced, the educational value of the conventions to them would be much lessened. Even the two days between the two conventions are by no means wasted. They are spent by many members in the interchange of ideas both among themselves and with representatives of the supply concerns, and in viewing the exhibits.

There probably is more sentiment against consolidation in the Master Car Builders' Association than in the Master Mechanics' Association. This is partly because it is felt that the Master Car Builders' Association ought to be allowed to go on independently with the very important legislative work of framing and perfecting the rules covering the interchange of equipment which it has done so successfully in the past. Another reason is the feeling that the importance of the car department in its relation to shop management and car design is not now as fully recognized by railway management as it should be, and that consolidation might tend to decrease the time and attention given to these matters, whereas the consideration given to them should be increased. Furthermore, it is felt by many that consolidation would not tend to improve the legislative work of the Master Car Builders' Association, as the motive power officers who have jurisdiction over the car department, and are therefore directly interested in the Master Car Builders' Association's work, are already members of it.

The proposition to unite two organizations which for a long period of years have done such important work is a serious matter. Mr. McKenna in his address last year as president of the Master Car Builders' Association, said: "Unless improvement is possible, changes should not be favored." Perhaps Mr. McKenna's statement should be changed to read, "Unless improvement is *probable*, changes should not be favored." There are many members of both associations who have not been convinced of the probability of improvement by the change proposed. But it must be conceded, as we said in the *Daily* last year, that the reasoning in favor of it is quite persuasive."

FRANK H. CLARK.

Rarely if ever has a man appeared before the Master Car Builders' Association as its presiding officer who has previously occupied so modest a position as a speaker upon the floor of the convention, as has Frank H. Clark, who presides at the meetings this year. This is far from saying that the honor conferred upon Mr. Clark was an accident or undeserved on account of the work he has done for the association. It is only another way of saying that he is emphatically a man of action rather than of words. What he has to say is summed up in a few words which go directly to the point. What he has had to do has largely been done before he came to the convention and his thoughtful consideration and sound judgment are reflected in the reports of other committees than those of which his name appears as chairman or member.

Mr. Clark's training has been such as to make him, now that he has risen to the top of his chosen line of work, much more of a thinker than of a talker. As the quiet student working out complicated problems or carrying on difficult tests in the multifarious lines of work in the office and in the field for the late David L. Barnes—as the chief draftsman and mechanical engineer of the road of which he is now general superintendent of motive power, he was in each position cultivating the faculty of getting to the bottom of things rather than of talking about them and guessing that the result would be so-and-so when he or some one else did get there. This training, as well as incidental work during the first period named as assistant to the then western editorial representative of the *Railroad Gazette*, emphasized the importance of accuracy and closeness of observation, terseness and clearness in putting into shape for report or publication and carefulness in drawing no conclusions not supported fully by the data in hand. Hence the soundness of judgment characterizing his actions as an administrative officer, which has been recognized by those who have placed him in a position such as few men have reached at his age and an appreciation of which has been shown by his fellow-officers of other roads in electing him to the presidency of their most influential association.

Mr. Clark is entirely a product of the West. Born at Pecatonica, Ill., in 1865, graduated from the University of Illinois in 1890; a few years of training with one of the most active and progressive of consulting engineers the mechanical railway field had up to that time known; this constitutes his history until he became chief draftsman of the Chicago, Burlington & Quincy in 1894. In 1899 he was appointed mechanical engineer, in 1902 he became superintendent of motive power and three years later general superintendent of motive power of the entire Burlington system. These few words give the outline of his official history. Notwithstanding the hard work necessarily called for by the rapid march of growing official duties, he has found time in the last ten years for much work for the association over which he now presides, though, as intimated, it appears less in the reports of discussions than in connection with committee reports. Among the subjects in which his work has been conspicuous are collarless journals, high-speed foundation brake gear, outside dimensions of box cars, automatic couplings for steam heat and air brake apparatus, and the annual revision of the rules for loading long material. He was a member of the committee on the revision of the constitution and by-laws and became a member of the executive committee in 1907. He should, perhaps, be classed as a locomotive man rather than as a car man and the proceedings of the Master Mechanics' Association indicate an even greater degree of activity in the affairs of that association.

M. C. B. OFFICERS FOR 1909-1910.

President.—F. H. Clark, C. B. & Q., Chicago, Ill.
 First Vice-President.—T. H. Curtis, L. & N., Louisville, Ky.
 Second Vice-President.—Le Grand Parish, Cleveland, O.
 Third Vice-President.—A. Stewart, Southern Ry., Washington, D. C.
 Treasurer.—John Kirby, Adrian, Mich.
 Executive Members.—D. F. Crawford, Penna. Lines, Pittsburgh, Pa.; F. W. Brazier, N. Y. C. & H. R., New York; C. A. Schroyer, Chicago & Northwestern, Chicago; J. D. Harris, Balto. & Ohio, Baltimore, Md.; C. E. Fuller, Union Pacific, Omaha, Neb.; H. D. Taylor, Phila. & Reading, Reading, Pa.
 Secretary.—Jos. W. Taylor, 390 Old Colony Building, Chicago.

M. M. OFFICERS FOR 1909-1910.

President.—G. W. Wildin, N. Y., N. H. & H., New Haven, Conn.
 First Vice-President.—C. E. Fuller, Union Pacific, Omaha, Neb.
 Second Vice-President.—H. T. Bentley, Chicago & North Western, Chicago, Ill.
 Third Vice-President.—D. F. Crawford, Penna. Lines West, Pittsburgh, Pa.
 Treasurer.—Angus Sinclair, New York.
 Executive Members.—D. R. MacBain, A. S. M. P., N. Y. C. & H. R., Albany, N. Y.; J. F. Walsh, S. M. P., Chesapeake & Ohio, Richmond, Va.; C. A. Seley, M. E., C. R. I. & P., Chicago; F. M. Whyte, C. M. E., New York Central Lines, New York; T. Rumney, M. S., Erie R. R., New York; T. H. Curtis, S. M., L. & N., Louisville, Ky.
 Secretary.—Jos. W. Taylor, 390 Old Colony Building, Chicago.

PROGRAM; M. C. B. ASSOCIATION.

WEDNESDAY, JUNE 15, 1910.
Morning Session.

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| Address by the President..... | 10:00 A. M. to 11:00 A. M. |
| Reading of the minutes of the last meeting | 11:00 A. M. to 11:05 A. M. |
| Report of Secretary and Treasurer.. | 11:05 A. M. to 11:20 A. M. |
| Assessment and announcement of annual dues; appointment of Committees on Correspondence, Resolutions, Obituaries, etc..... | 11:20 A. M. to 11:30 A. M. |
| Election of Auditing Committee | 11:30 A. M. to 11:35 A. M. |
| Unfinished Business | 11:35 A. M. to 11:40 A. M. |
| New Business | 11:40 A. M. to 11:50 A. M. |
| Discussion of Reports on: | |
| Nominations | 11:50 A. M. to 12:00 M. |
| Revision of Standards and Recommended Practice | 12:00 M. to 12:30 P. M. |
| Adjournment. | |

Afternoon Session.

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| Discussion of Reports on: | |
| Train Brake and Signal Equipment | 2:00 P. M. to 2:30 P. M. |
| Brake Shoe Tests..... | 2:30 P. M. to 3:30 P. M. |
| Rules for Loading Materials..... | 3:30 P. M. to 4:00 P. M. |
| Adjournment. | |

THURSDAY, JUNE 16, 1910.
Morning Session.

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| Discussion of Reports on: | |
| Rules of Interchange..... | 10:00 A. M. to 10:30 A. M. |
| Coupler and Draft Equipment.... | 10:30 A. M. to 11:00 A. M. |

Car Wheels 11:00 A. M. to 12:00 M.
 Safety Appliances 12:00 M. to 12:15 P. M.
 Freight Car Trucks 12:15 P. M. to 12:30 P. M.

Adjournment.

Afternoon Session.

Discussion of Reports on:

Splicing Underframes 2:00 P. M. to 2:30 P. M.
 Car Framing, Roofs and Doors 2:30 P. M. to 3:00 P. M.
 Tank Cars 3:00 P. M. to 3:30 P. M.
 Train Pipe and Connections for
 Steam Heat 3:30 P. M. to 4:00 P. M.

Adjournment.

FRIDAY, JUNE 17, 1910.
 Morning Session.

Discussion of Reports on:

Consolidation of Master Car Builders' and Master Mechanics' Associations 10:00 A. M. to 10:30 A. M.
 Classes of Cars 10:30 A. M. to 11:00 A. M.
 Salt-water Drippings from Refrigerator Cars 11:00 A. M. to 11:15 A. M.
 Mounting Pressures on Wheels and Axles 11:15 A. M. to 11:45 A. M.
 Individual paper on "Design of Axle to Carry 50,000 Pounds," by E. D. Nelson, Engr. Tests, Pennsylvania Railroad 11:45 A. M. to 12:00 M.
 Springs for Freight Car Trucks 12:00 M. to 12:30 P. M.

Adjournment.

Afternoon Session.

Discussion of Reports on:

Train Lighting and Equipment 2:00 P. M. to 2:30 P. M.
 Lumber Specifications 2:30 P. M. to 3:00 P. M.
 Unfinished business; Reports of Committees on Correspondence, Resolutions, and such other committees as may be named during the convention 3:00 P. M. to 3:15 P. M.
 Election of Officers 3:15 P. M. to 4:00 P. M.

Adjournment.

M. C. B. COMMITTEES.

STANDING COMMITTEES.

Arbitration

J. J. Hennessy (chairman), C. M. & St. P., W. Milwaukee, Wis.; E. D. Bronner, Mich. Cent., Detroit, Mich.; T. W. Demarest, Penna. Lines, Ft. Wayne, Ind.; W. A. Nettleton, Rock Island Lines, Chicago; J. S. Lentz, Lehigh Valley, S. Bethlehem, Pa.

Standards and Recommended Practice

R. L. Kleine, Penna. R. R., Altoona, Pa.; John Hair, B. & O. S. W., Cincinnati, O.; T. M. Ramsdell, Chesapeake & Ohio, Richmond, Va.; W. E. Dunham, Chicago & North Western, Winona, Minn.; T. H. Goodnow, L. S. & M. S., Chicago.

Train Brake and Signal Equipment

A. J. Cota (chairman), C. B. & Q., Chicago; F. H. Scheffer, N. C. & St. L., Nashville, Tenn.; R. K. Reading, Penna. R. R., Buffalo, N. Y.; E. W. Pratt, C. & N. W., Chicago; R. B. Kendig, L. S. & M. S., Cleveland, O.; T. L. Burton, C. of N. J., Jersey City, N. J.; B. P. Flory, N. Y. O & W., Middletown, N. Y.

Brake Shoe Tests

W. F. M. Goss (chairman), University of Illinois, Urbana, Ill.; J. R. Onderdonk, B. & O., Baltimore, Md.; Wm. McIntosh, Jersey City, N. J.

Coupler and Draft Equipment

R. N. Durborow (chairman), Penna. R. R., Altoona, Pa.; G. W. Wildin, N. Y., N. H. & H., New Haven, Conn.; F. W. Brazier, N. Y. C. & H. R., New York; T. H. Curtis, L. & N., Louisville, Ky.; F. H. Stark, Pittsburgh Coal Co., Coraopolis, Pa.; Thos. Roope, C. B. & Q., Lincoln, Neb.; W. E. Symons, Chicago.

Rules for Loading Materials

A. Kearney (chairman), N. & W., Roanoke, Va.; C. E. Fuller, Union Pacific, Omaha, Neb.; A. Stewart, Southern Ry., Washington, D. C.; Wm. Moir, Northern Pacific, St. Paul, Minn.; J. S. Lentz, Lehigh Valley, S. Bethlehem, Pa.; W. F. Keisel, Jr., Penna. R. R., Altoona, Pa.; L. H. Turner, P. & L. E., Pittsburgh, Pa.

Car Wheels

Wm. Garstang (chairman), C. C. C. & St. L., Indianapolis, Ind.; W. C. A. Henry, Penna. Lines, Columbus, O.; A. E. Manchester, C. M. & St. P., W. Milwaukee, Wis.; R. W. Burnett, Can. Pac., Montreal, Can.; R. L. Ettenger, Southern Ry., Washington, D. C.; A. Kearney, N. & W., Roanoke, Va.; O. C. Cromwell, B. & O., Baltimore, Md.

Safety Appliances

C. A. Seley (chairman), C. R. I. & P., Chicago; A. Lamar, Penna. Lines, Ft. Wayne, Ind.; T. H. Curtis, L. & N., Louisville, Ky.; C. B. Young, C. B. & Q., Chicago; Le Grand Parish, Cleveland, O.; H. Bartlett, B. & M., Boston, Mass.; T. M. Ramsdell, C. & O., Richmond, Va.

SPECIAL COMMITTEES.

Freight Car Trucks

A. Stewart (chairman), Southern Ry., Washington, D. C.; J. J. Tatum, B. & O., Baltimore, Md.; A. S. Vogt, Penna. R. R., Altoona, Pa.; J. F. DeVoy, C. M. & St. P., W. Milwaukee, Wis.; G. A. Hancock, St. L. & S. F., Springfield, Mo.

Splicing Underframes

R. E. Smith (chairman), A. C. L., Wilmington, N. C.; W. F. Bentley, B. & O., Baltimore, Md.; H. L. Trimyer, S. A. L., Portsmouth, Va.; I. S. Downing, L. S. & M. S., Collinwood, O.; F. A. Torrey, C. B. & Q., Chicago.

Car Framing, Roof and Doors

W. F. Bentley, B. & O., Baltimore, Md.; J. A. McRae, Mich. Cent., Detroit, Mich.; R. S. Miller, N. Y. C. & St. L., Cleveland, O.; C. F. Thiele, Penna. Lines, Columbus, O.; G. W. Lillie, St. L. & S. F., Springfield, Mo.

Tank Cars

A. W. Gibbs (chairman), Penna. R. R., Altoona, Pa.; C. M. Bloxham, Union Tank Line, New York; J. W. Fogg, Chicago Ter. Trans., E. Chicago, Ind.; Wm. McIntosh, Jersey City, N. J.; S. K. Dickerson, L. S. & M. S., Cleveland, O.

Train Pipe and Connections for Steam Heat

I. S. Downing (chairman), L. S. & M. S., Collinwood, O.; C. A. Schroyer, C. & N. W., Chicago; H. E. Passmore, T. & O. C., Kenton, O.; T. H. Russum, B. & O., Baltimore, Md.; J. J. Ewing, C. & O., Richmond, Va.

Classes of Cars

Jas. Miliken, P. B. & W., Wilmington, Del.; J. N. Mowery, Lehigh Valley, S. Bethlehem, Pa.; F. M. Whyte, N. Y. Cent. Lines, New York.

Salt-water Drippings from Refrigerator Cars

M. K. Barnum (chairman), Illinois Central, Chicago; G. W. Lillie, St. L. & S. F., Springfield, Mo.; W. E. Sharp, Armour & Co., Chicago; E. W. Pratt, C. & N. W., Chicago; P. Maher, C. & A., Bloomington, Ill.; D. C. Ross, Mich. Cent., Detroit, Mich.; W. C. Arp, Vandalia, Terre Haute, Ind.

Mounting Pressures for Various Wheels and Axles

E. D. Nelson, Penna. R. R., Altoona, Pa.; A. Forsyth, C. B. & Q., Aurora, Ill.; W. T. Gorrell, Phila. & Reading, Reading, Pa.; J. F. Walsh, Ches. & Ohio, Richmond, Va.; W. P. Richardson, P. & L. E., Pittsburgh, Pa.

Springs for Freight Car Trucks

F. M. Gilbert, N. Y. C. & H. R., New York; W. F. Keisel, Penna. R. R., Altoona, Pa.; M. H. Wickhorst, C. B. & Q., Aurora, Ill.; T. A. Lawes, Southern Indiana, Bedford, Ind.; H. C. May, L. & N., Louisville, Ky.

Train Lighting and Equipment

T. R. Cook, Penna. Lines, Ft. Wayne, Ind.; Carl Brandt, L. S. & M. S., Cleveland, O.; Ward Barnum, L. & N., Louisville, Ky.; J. H. Davis, B. & O., Baltimore, Md.; E. A. Benson, Pullman Co., Chicago.

Lumber Specifications

G. N. Dow, L. S. & M. S., Cleveland, O.; G. H. Gilman, Northern Pacific, St. Paul, Minn.; R. W. Burnett, Can. Pac., Montreal, Can.

Consolidation

F. H. Clark, C. B. & Q., Chicago; W. A. Nettleton, C. R. I. & P., Chicago; C. A. Schroyer, C. & N. W., Chicago.

Arrangements

F. H. Clark, C. B. & Q., Chicago.

Nominations

J. S. Lentz, L. V., S. Bethlehem, Pa.; J. F. Deems, N. Y. Central Lines, New York; W. H. Lewis, N. & W., Roanoke, Va.; A. W. Gibbs, Penna. R. R., Altoona, Pa.; J. E. Buker, Chicago.

PROGRAM; M. M. ASSOCIATION.

MONDAY, JUNE 20, 1910.

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| Prayer | 9:30 A. M. to 9:35 A. M. |
| Address of President..... | 9:35 A. M. to 9:50 A. M. |
| Intermission | 9:50 A. M. to 9:55 A. M. |
| To allow those who wish to retire to do so, although all are requested to remain. | |
| Action on minutes of convention of 1909 | 9:55 A. M. to 10:00 A. M. |
| Reports of Secretary and Treasurer. | 10:00 A. M. to 10:15 A. M. |
| Assessment and announcement of dues; appointment of Committees on Correspondence, Resolutions, Nominations, Obituaries, etc..... | 10:15 A. M. to 10:25 A. M. |
| Election of Auditing Committee.... | 10:25 A. M. to 10:30 A. M. |
| Unfinished Business | 10:30 A. M. to 10:35 A. M. |
| New Business | 10:35 A. M. to 10:45 A. M. |
| Discussion of Reports on: | |
| Mechanical Stokers | 10:45 A. M. to 11:00 A. M. |
| Revision of Standards..... | 11:00 A. M. to 11:15 A. M. |
| Individual Paper by W. S. Hayes, Supt. Loco. Operation, Erie R. R., "Fuel Economies" | 11:15 A. M. to 12:00 M. |
| Topical Discussions: | |
| "Self-dumping Ash Cans," by H. T. Bentley, A. S. M. P., C. & N. W. | 12:00 M. to 12:30 P. M. |
| "Apprenticeship Education," by F. W. Thomas, Supervisor of Apprentices, A. T. & S. F..... | 12:30 P. M. to 1:00 P. M. |
| Discussion of Report on: | |
| Motive Power Development..... | 1:00 P. M. to 1:30 P. M. |
| Adjournment. | |

TUESDAY, JUNE 21, 1910.

Discussion of Reports on:

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| Widening Gauge on Curves..... | 9:30 A. M. to 9:45 A. M. |
| Steel Tires | 9:45 A. M. to 10:00 A. M. |
| Safety Appliances | 10:00 A. M. to 10:15 A. M. |
| Superheaters | |
| Individual paper on "Locomotive Performance Under Different Degrees of Superheat," by Prof. C. H. Benjamin, Purdue University | 10:15 A. M. to 12:00 M. |
| Individual paper on "Locomotive Frame Construction," by H. T. Bentley, A. S. M. P., C. & N. W.... | 12:00 M. to 12:30 P. M. |
| Report of Committee on Safety Valves | 12:30 P. M. to 1:00 P. M. |
| Report of Committee on Lumber Specifications | 1:00 P. M. to 1:30 P. M. |
| Adjournment. | |

WEDNESDAY, JUNE 22, 1910.

Discussion of Report on:

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| Train Brake and Signal Equipment | 9:30 A. M. to 10:00 A. M. |
| Individual paper on "Freight Train Resistance," by Prof. E. C. Schmidt, University of Illinois | 10:00 A. M. to 11:00 A. M. |
| Discussion of Reports on: | |
| Locomotive and Shop Operating Costs | 11:00 A. M. to 11:45 A. M. |
| Design, Construction and Inspection of Locomotive Boilers.... | 11:45 A. M. to 12:00 M. |
| Consolidation of Master Mechanics' and Master Car Builders' Associations | 12:00 M. to 12:15 P. M. |
| Resolutions, Correspondence, etc.. | 12:15 P. M. to 12:30 P. M. |
| Unfinished Business | 12:30 P. M. to 12:45 P. M. |
| Election of Officers | 12:45 P. M. to 1:30 P. M. |
| Closing Exercises | |
| Adjournment. | |

M. M. COMMITTEES.

STANDING COMMITTEES.

Mechanical Stokers

T. Rumney (chairman), Erie R. R., New York; E. D. Nelson, Penna. R. R., Altoona, Pa.; C. E. Gossett, Iowa Central, Marshalltown, Iowa; J. A. Carney, C. B. & Q., West Burlington, Iowa; Geo. Hodgins, 114 Liberty street, New York.

SPECIAL COMMITTEES.

Revision of Standards

W. H. V. Rosing (chairman), Mo. Pac., St. Louis, Mo.; T. W. Demarest, Penna. Lines, Ft. Wayne, Ind.; F. M. Gilbert, N. Y. C. & H. R., New York; J. D. Harris, Baltimore & Ohio, Baltimore, Md.; H. T. Bentley, C. & N. W., Chicago.

Motive Power Development

Robt. Quayle (chairman), C. & N. W., Chicago; C. E. Fuller, Union Pacific, Omaha, Neb.; R. N. Durborow, Penna. R. R., Altoona, Pa.; Angus Sinclair, 114 Liberty street, New York; J. G. Neuffer, Ill. Cent., Chicago; G. W. Wildin, N. Y. N. H. & H., New Haven, Conn.; C. H. Quereau, N. Y. C. & H. R., New York.

Superheaters

L. R. Johnson (chairman), Can. Pac., Montreal, Can.; F. F. Gaines, Central of Georgia, Savannah, Ga.; R. D. Hawkins, Great Northern, St. Paul, Minn.; H. W. Jacobs, A. T. & S. F., Topeka, Kan.; W. J. Tollerton, C. R. I. & P., Chicago.

Widening Gauge on Curves

F. M. Whyte (chairman), N. Y. C. Lines, New York; W. H.

Lewis, N. & W., Roanoke, Va.; F. C. Cleaver, Rutland R. R., Rutland, Vt.

Steel Tires

A. Stewart (chairman), Southern Ry., Washington, D. C.; A. S. Vogt, Penna. R. R., Altoona, Pa.; Wm. Moir, Nor. Pac., St. Paul, Minn.; E. D. Bronner, Mich. Cent., Detroit, Mich.; H. D. Taylor, P. & R., Reading, Pa.

Safety Appliances

C. A. Seley (chairman), C. R. I. & P., Chicago; T. H. Curtis, L. & N., Louisville, Ky.; C. B. Young, C. B. & Q., Chicago; Le Grand Parish, Cleveland, Ohio; Henry Bartlett, Boston & Maine, Boston, Mass.

Lumber Specifications

R. E. Smith (chairman), A. C. L., Wilmington, N. C.; J. F. De Voy, C. M. & St. P., Milwaukee, Wis.; T. W. Demarest, Penna. Lines, Ft. Wayne, Ind.

Train Brake and Signal Equipment

A. J. Cota (chairman), C. B. & Q., Chicago; F. H. Scheffer, N. C. & St. L., Nashville, Tenn.; R. K. Reading, Penna. R. R., Buffalo, N. Y.; E. W. Pratt, C. & N. W., Chicago; R. B. Kendig, L. S. & M. S., Cleveland, Ohio; T. L. Burton, P. & R., Jersey City, N. J.; B. P. Flory, N. Y. O. & W., Middletown, N. Y.

Locomotive and Shop Operating Costs

H. H. Vaughan (chairman), Can. Pac., Montreal; Le Grand Parish, Cleveland, Ohio; W. C. A. Henry, Penna. Lines, Columbus, Ohio; G. W. Seidel, C. R. I. & P., Silvis, Ill.; M. J. McCarthy, C. C. C. & St. L., Indianapolis, Ind.

Consolidation

D. F. Crawford, Penna. Lines, Pittsburgh, Pa.; H. H. Vaughan, Can. Pac., Montreal, Canada; G. W. Wildin, N. Y. N. H. & H., New Haven, Conn.

Arrangements

G. W. Wildin, N. Y. N. H. & H., New Haven, Conn.

Design, Construction and Inspection of Locomotive Boilers

T. H. Curtis (chairman), L. & N., Louisville, Ky.; D. R. MacBain, N. Y. C. & H. R., W. Albany, N. Y.; A. E. Manchester, C. M. & St. P., W. Milwaukee, Wis.; A. W. Gibbs, Penna. R. R., Altoona, Pa.; W. H. V. Rosing, Mo. Pac., St. Louis, Mo.; W. E. Symons, Chicago; G. H. Emerson, Great Northern, St. Paul, Minn.

CORNELL DINNER.

As in previous years, the Cornell men attending the convention will hold a banquet on the evening of Saturday, June 18. The dinner this year will again be held at the Hotel Chelsea.

Cornell men are requested to register at the Booth of the *American Engineer and Railroad Journal*, on the north side of the main building opposite the centre stairway, as soon as possible, so that the committee may have information as to the number of plates to order.

The plans for his year's dinner indicate that it will be the best ever held, and all Cornell men are urged to so arrange their affairs as to be present.

In the provisions of the concession of the French government to private companies to operate railways there is an article which provides that locomotives shall be built on the latest models, that they must consume their own smoke and that they must satisfy all the conditions prescribed by the state administration. Passenger coaches also must be built on the latest models.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.

The officers and members of the Executive Committee of the Railway Supply Manufacturers' Association are the real burden bearers of these annual gatherings. Once the joint committee of the Master Car Builders' and the Master Mechanics' Associations has decided where the convention shall be held, their troubles begin—and they never end. Even if Atlantic City continues to draw the annual prize, there's going to be considerable wailing and gnashing of teeth; because this year's Exhibit Committee was besieged with applications for space that couldn't be filled. But should the vote favor any other location, what's going to happen? It will be sad to contemplate, unless something new in the way of facilities puts in an appearance between now and the end of the year.

The Executive Committee is composed of twelve members, who represent seven geographical districts. The 1909-10 committee consists of the following:

First District—New England states; one member, Albert C. Ashton, Ashton Valve Company, Boston, Mass.

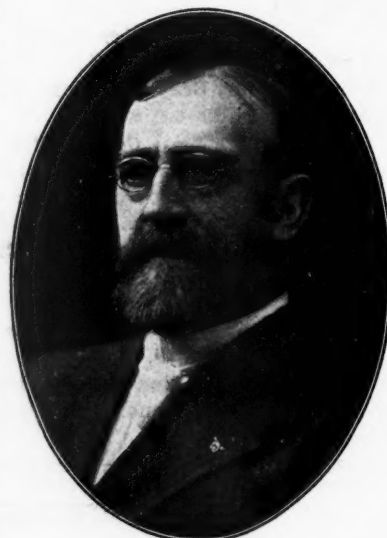
Second District—New York and New Jersey; three members, Thomas Aldcorn (treasurer), Chicago Pneumatic Tool Company, New York City; A. L. Whipple, Whipple Supply Company, New York City; and Charles P. Storrs, Storrs Mica Company, Owego, N. Y.

Third District—Pennsylvania, Maryland, District of Columbia and West Virginia; two members, Edward M. Grove (president), The McConway & Torley Company, Pittsburgh, Pa.; and B. E. D. Stafford, Flannery Bolt Company, Pittsburgh, Pa.

Fourth District—Ohio, Indiana, Michigan, Kentucky and Tennessee; two members, S. P. Bush, Buckeye Steel Castings Company, Columbus, Ohio; and A. D. McAdam, St. Louis surfacer and Paint Company and Ohio Malleable Iron Company, Chicago.

Fifth District—Illinois, Wisconsin, Iowa and Minnesota; two members, L. R. Phillips, (vice-president), National Tube Company, Chicago, Ill.; and W. H. Miner Company, Chicago, Ill.

Sixth District—Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama and Mississippi; one member, A. C. Langston, Jenkins Brothers, Atlanta, Ga.



Edward M. Grove,
President.



L. R. Phillips,
Vice-President.

ber, A. C. Langston, Jenkins Brothers, Atlanta, Ga.



Charles P. Storrs.



S. P. Bush.



Albert C. Ashton.



B. E. D. Stafford.
Chairman, Exhibit Committee.



A. L. Whipple.
Chairman, Badge Committee.



Arthur C. Langston.



A. D. McAdam.



E. L. Adreon.

Members of the Executive Committee of the Railway Supply Manufacturers' Association.

Seventh District—States west of the Mississippi river, including Louisiana but excepting Iowa and Minnesota; one member, E. L. Adreon, American Brake Company, St. Louis, Mo.

With each annual meeting, four members retire and their successors are elected for three year terms. Those who will retire this year, are: Thomas Aldcorn (Second District); S. P. Bush (Fourth District); W. H. Miner (Fifth District); and A. L. Whipple (Second District).

In the *Daily* of June 23, 1909, we printed a brief history of the Railway Supply Manufacturers' Association. At the last annual convention a committee, consisting of Samuel G. Allen (chairman), A. L. Whipple, Harry W. Frost, E. V. Sedgwick, E. M. Gold, A. L. Humphreys, C. C. Pierce, George A. Post, Mark A. Ross and Albert Waycott, was appointed to revise the constitution and bylaws. Its report will be received and acted upon at Saturday's meeting.

The Executive Committee's plans are carried out by several committees. This year's committees are:

Finance—W. H. Miner, W. H. Miner Company, Chicago (chairman); A. C. Ashton, Ashton Valve Company, Boston, Mass.; and A. C. Langston, Jenkins Brothers, Atlanta, Ga.

Exhibit—B. E. D. Stafford, Flannery Bolt Company, Pittsburgh, Pa. (chairman); Charles P. Storrs, Storrs Mica Company, Owego, N. Y.; and S. P. Bush, Buckeye Steel Castings Company, Columbus, Ohio.

Entertainment—J. Will Johnson, Pyle-National Headlight Company, Chicago (chairman); Bertram Berry, Heywood Brothers & Wakefield Company, New York; Ross F. Hayes, Curtain Supply Company, New York; C. M. Garrett, Garrett Supply Company, Chicago; J. L. Connors, Ralston Steel Car Company, Columbus, Ohio;



John D. Conway.
Secretary.

W. J. Walsh, Galena-Signal Oil Company, Chicago; H. E. Oesterreich, Wendall & McDuffie Company, New York; Phillip J. Mitchell, Phillip S. Justice & Company, Philadelphia, Pa.; Leonard J. Hibbard, L. J. Hibbard Company, New York; J. C. Younglove, H. W. Johns-Manville Company, Chicago; E. S. Toothe, Nathan Manufacturing Company, New York; Frank Martin, Jenkins Brothers, New York; G. L. Walters, Adams & Westlake Company, Chicago; George Groobey, Buckeye Steel Castings Company, Atlanta, Ga.; Charles P. Williams, Chicago Railway Equipment Company, New York;



Thomas Aldcorn.
Treasurer.

Charles A. Knill, Charles H. Besly & Company, Chicago; F. B. Ernst, American Steel Foundries, New York; C. A. Dunkelberg, S. F. Bowser & Company, Fort Wayne, Ind.; Ralph G. Coburn, Franklin Railway Supply Company, Chicago; J. H. Janes, Talmage Mfg. Company, Cleveland, Ohio; H. A. Neally, Joseph Dixon Crucible Company, Boston, Mass.; George R. Carr, Dearborn Drug & Chemical Works, Chicago; George Moses, James B. Sipe & Company, Pittsburgh, Pa.; William Miller, Adreon Manufacturing Company, Chicago; Herbert Green, Grip Nut Company, Chicago; C. W. Wardell, Welsbach Company, Gloucester, N. J.; Edward Payson Smith, Standard Railway Equipment Company, Chicago; J. Soule Smith, American Steel Foundries, Chicago; and Thomas Farmer, Jr., Consolidated Car Heating Company, New York.

The Entertainment Committee is divided into thirteen sub-committees, as follows:

Door.—In charge of entrance at all entertainments. Messrs. Hays (chairman), Hibbard, Knill, Williams, Walters and Green.

M. C. B. Reception.—In charge of M. C. B. Reception, Wednesday evening. Messrs. Farmer (chairman), Hays, Garrett, Ernst, Carr, Connors, Berry, Green and Coburn.

Marshalls.—To escort officers of the two associations and their ladies, to all formal receptions and to the two balls. Messrs. Garrett (chairman), Mitchell, Martin, Groobey, Dunkelberg, Janes, Moses, Neally and E. P. Smith.

Afternoon Entertainments.—In charge of all afternoon entertainments. Messrs. Berry (chairman), Hays, Oesterreich, Walters, Carr and Janes.

M. C. B. Ball.—In charge of M. C. B. ball, Thursday evening. Messrs. Connors (chairman), Walsh, Toothe, Younglove, E. P. Smith, Martin, Moses, Garrett, Oesterreich, Berry, Wardell and Farmer.

Introduction.—The members of this committee will devote most of their time at the M. C. B. and M. M. balls, and at all informal dances to introducing members and guests, and their families, who care to dance. Walsh (chairman), Miller, Ernst, Mitchell, Dunkelberg, Neally, Farmer, Janes, Groobey, Coburn and E. P. Smith.

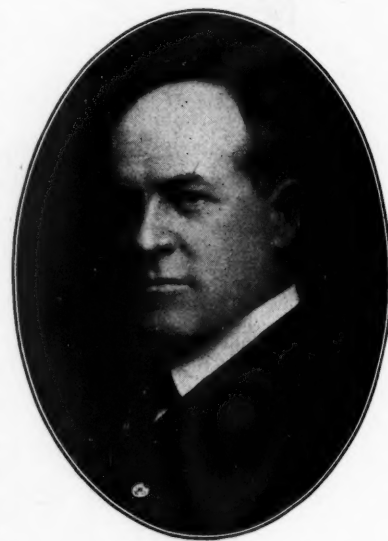
Base Ball.—In charge of base ball game, Saturday afternoon. Messrs. Hibbard (chairman), Connors, Mitchell, Martin, Ernst, Walsh and E. P. Smith.

Military Euchre.—In charge of euchre party, Friday evening. Messrs. Younglove (chairman), Berry, Connors, Dunkelberg, Oesterreich, Mitchell, Hays, Toothe, Knill, Walsh, Carr, Miller, Coburn and Ernst.

Saturday Evening's Entertainment.—In charge of entertainment, Saturday evening. Messrs. Dunkelberg (chairman), Carr, Wardell and J. Soule Smith.

M. M. Reception.—In charge of M. M. reception, Monday evening. Messrs. Ernst (chairman), Hibbard, Neally, Moses, Hays, Knill, Toothe, Coburn, Williams, Green, Oesterreich and J. Soule Smith.

M. M. Ball.—The committee that will be in charge of M. M. ball, Tuesday evening. Messrs. Hibbard (chairman), Younglove, Berry, Garrett, Connors, Old, Farmer, Mar-



J. Will Johnson.

tin, Toothe, Janes, Ernst, Coburn, J. Soule Smith and Oesterreich.

Ushers.—In charge of seating guests and distributing programs at all entertainments. Messrs. Mitchell (chairman), Groobey, Ernst, Janes, Moses, Neally, Toothe, Martin, Dunkelberg, Miller and Wardell.

Informal Dance.—In charge of all informal dances. Messrs. Oesterreich (chairman), Garrett, Hays, Hibbard, Knill Farmer, Carr, Old, Toothe, Martin and Miller.

Enrollment Committee.—W. W. Rosser, The T. H. Symington Company, Chicago (chairman); H. D. Hammond, National Malleable Castings Company, Indianapolis, Ind.; A. E. Hooven,



W. W. Rosser,
Chairman, Enrollment Committee.

Railway & Engineering Review, New York; Oscar F. Ostby, Commercial Acetylene Company, New York; J. W. Dalman, American Steel Foundries, Chicago; W. A. Polk, Patterson-Sargent Company, Cleveland, Ohio; W. S. Hammond, Jr., Consolidated Car Heating Company, Chicago; Allen S. Barrows, Pantasote Company, Chicago; F. V. Green, Westinghouse Air Brake Company, New York; M. S. Simpson, Pressed Steel Car Company, Pittsburgh, Pa.; Harry F. Jefferson, United & Globe Rubber Manufacturing Company, Pittsburgh,

Pa.; George A. Murphy, Hewitt Supply Company, Chicago, and James G. Mowry, Patton Paint Company, Milwaukee, Wis.

Transportation Committee.—Lucian C. Brown, The United Equipment Company, New York (chairman); Joseph H. Kuhns, Republic Rubber Company, Chicago; C. O. Taylor, Ball Chemical Company, Chicago; Joseph M. Brown, Peter Gray & Sons, Chicago; W. R. Parker, John Lucas & Company, Chicago; F. W. Edwards, Ohio Injector Company, Chicago; J. L. Ponie, James B. Clow Company, Chicago; F. E. Symons, Ralston Steel Car Company, Columbus, Ohio; W. J. Caton, Thomas E. Colo Lumber Company, Philadelphia, Pa.; Frank M. Grigg, Adams & Westlake, Philadelphia, Pa.; John D. McClintock, Wm. Sellers & Company, Incorp., Philadelphia, Pa.; J. Allen Dillon, National Tube Company, New York; P. H. Ferguson, Pittsburgh Steel Products Company, New York; William B. McCarthy, Rostand Manufacturing Company, Milford, Conn.; George Trigg, John Lucas Company, Philadelphia, Pa.; J. H. Klink, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.; G. S. Stuart, Franklin Manufacturing Company, Franklin, Pa.; E. A. Still-



Lucian C. Brown,
Chairman, Transportation Committee.

man, The Watson & Stillman Company, New York; Joseph A. Renton, Kerite Insulated Wire & Cable Company, New York; T. W. Brander, Brander Supply Company, New York; and Carter Blatchford, Spencer-Otis Company, Chicago.

Badge Committee.—A. L. Whipple, Whipple Supply Company, New York (chairman); Charles P. Storrs, Storrs Mica Company, Owego, N. Y.; and S. P. Bush, Buckeye Steel Castings Company, Columbus, Ohio.

It will be a hard matter for the next committee to furnish a badge for the supply contingent that will beat this year's in neatness and attractiveness of design and finish. And they were made by a member of the Railway Supply Manufacturers' Association—the American Railway Supply Company.

While all the badges under the control of the Railway Supply Manufacturers' Association will be alike in design,



the enamel centres will differ in color. The badges to be worn by members of the association will have red centres, while the badges of the women members of their families will have white centres. Green and green and white centre badges, respectively, have been provided for male and female guests who are residents of Atlantic City. The women guests of members of the Master Car Builders' and

American Railway Master Mechanics' Association will wear badges with white centres.

The general understanding is that the work of the Badge Committee begins and ends with the task of making the badges. But this isn't so. To prove it, let someone who is not legitimately entitled to adorn his person with one of these metal passwords try to "work" the coveted prize. Not only will he not succeed; but he'll get a lesson in diplomacy to boot. To the chairman of the present committee is due much of the credit for stopping the indiscriminate distribution of badges that existed for so many years. He had an uphill fight; but he won.

This article would be incomplete without a word of commendation for the Exhibit Committee. Of all the thankless jobs connected with the committee work of these conventions, that of the Exhibit Committee is in the superlative degree. Its members get a whole lot of abuse of which they're conscious; and some choice selections of which they happily know nothing, unless it be that their ears tingle unusually long and severe at times. During the past few weeks we've run across more than one person who "could have done better," had the undertaking fallen to his lot; but the result speaks for itself. And the bulk of allotments were made in one day with a precision and speed that showed careful planning and a thorough understanding of the situation. While it is unfortunate that all comers could not be given space on the pier, it is hard to see where the committee is to blame.

LOCATION OF OFFICE OF SUPPLY ASSOCIATION.

The location of the office of the secretary of the Railway Supply Manufacturers' Association in the Exhibition Hall, just beyond the Aquarium Court at the left, is a great improvement over having it upstairs, away from the exhibits, as it was last year. J. D. Conway, the secretary, will be in the office from 8.30 a. m. to 5.30 p. m.; and as much more as may be necessary. Mr. Conway is to be congratulated on the systematic way in which the detail work of his office is being handled and the good results which are being obtained. These things, together with a plentiful supply of good humor, are bound to make his first year on the job a big success.

ENTERTAINMENTS.

The Entertainment Committee has endeavored to furnish entertainment for the members and guests of this year's conventions that will at once help to promote sociability and be in keeping with the high standard of the last few years. The program follows; but our readers may expect to find further references to this feature of the convention in the *Daily* from day to day.

WEDNESDAY, JUNE 15.

9.30 a.m.—Grand march from Marlborough-Blenheim Hotel to Convention Hall, Million Dollar Pier.

10.30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

3.30 p.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

9 p.m.—Reception by the president and officers of the Master Car Builders' Association in the Blenheim Exchange, Marlborough-Blenheim Hotel. Miss Alice Shaw, La Brillante Siffleuse.

10.30 p.m.—Dancing, ball room, Marlborough-Blenheim Hotel.

THURSDAY, JUNE 16.

10.30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

3.30 p.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

9.30 p.m.—Forty-fourth annual ball of the Master Car Builders' Association, Entrance Hall, Million Dollar Pier.

FRIDAY, JUNE 17.

10.30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

3 p.m.—Adept mystic. Miss Eva Fay, in her wonderful work of thaumaturgy, occult demonstrations. Miss Vera Berliner, violinist. West Solarium, Marlborough-Blenheim Hotel.

9 p.m.—Military euchre, Entrance Hall, Million Dollar Pier.

SATURDAY, JUNE 18.

10.30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

2 p.m.—Baseball parade from Million Dollar Pier to special trolley cars.

3 p.m.—Baseball game, East vs. West; at Pennsylvania Railroad Company's Inlet Park Baseball Grounds.

9 p.m.—All-star vaudeville show, at Apollo Theatre.

SUNDAY, JUNE 19.

11 a.m.—Special program by Marlborough-Blenheim Orchestra, Blenheim Exchange, Marlborough-Blenheim Hotel.

MONDAY, JUNE 20.

9 a.m.—Grand march from Marlborough-Blenheim Hotel to Convention Hall, Million Dollar Pier.

10.30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

3 p.m.—Piano, song and story recital, Willa Holt Wakefield, West Solarium, Marlborough-Blenheim Hotel.

9 p.m.—Reception by the president and officers of the American Railway Master Mechanics' Association, Blenheim Exchange, Marlborough-Blenheim Hotel. Cadets de Gascogne, direct from La Scala Theatre, Milan, Italy.

TUESDAY, JUNE 21.

10.30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

3.30 p.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

9.30 p.m.—Forty-third annual ball of the American Railway Master Mechanics' Association.

The music in connection with the convention will be supplied by the Old Guard Band and Orchestra of New York, Henry Conrad, Director.

The Transportation Committee has provided roller chairs for members and guests of the convention from June 15 to June 23, both inclusive. Stations will be located at the main entrance of the Million Dollar Pier; at the Marlborough-Blenheim Hotel; and at Chalfonte. The chairs may be had from the Pier from 9 a.m. to 7 p.m.; from the Marlborough-Blenheim Hotel from 9 a.m. to 6 p.m.; to both grand balls (Thursday night of this week and Tuesday night of next week) 8.30 p.m. to 10 p.m.; and to the Military Euchre (Friday night) 8 p.m. to 10 p.m. Unoccupied chairs may be stopped anywhere on the Boardwalk, except between the Marlborough-Blenheim Hotel and the Million Dollar Pier; and they may be used in either direction. Chairs will not be permitted to wait at any given point more than 15 minutes.

The Country Club of Atlantic City has extended the privileges of its club house to all members and guests of the convention. Admission to the grounds will be by badge.

MR. HOOLEY ON ATLANTIC CITY.

"I see be th' pa-apers," remarked Mr. Hooley to his friend Dennissey, one morn'ing in May as the latter strayed into his place to get the news of the day, "I see be th' pa-apers that the McHannix clan 's goin' to hold its annooal convintion at 'Tlantic City agin this year."

"What's the McHannix clan?" inquired Mr. Dennissey, as if that was what he was expected to ask.

"'Tis some reirod min—th' la-ads that boss th' shops, 'nd till th' min how t' run th' engines, and build th' ca-ars,' 'nd to burn shlate 'nd coal, 'nd kape up stame. Wanst in th' year, in Joon, whin th' air's bammy 'nd th' wather's fine, they arl get together 'nd talk about ut, 'nd aich wan finds out what th' other la-ad is doin' so's not to make th' same mis-thake himself. 'Tis a fine pla-ace, too, is 'Tlantic City. Th' Mare's a frind av mine, 'nd I'm thinkin' I'll be takin' me vacation on th' sayshore at th' same time, account av th' rates."

"What's th' Mare got to do about ut?" asked Mr. Dennissey.

"'Tis plain ye niver were at 'Tlantic City," replied Mr. Hooley emphatically. "Th' Mare av 'Tlantic City 's a bigger man than th' hull state av Noo Jersey, 'nd whin th' mimbers av th' legislachoor passed an ord'nance to shut up some pla-aces he's got there be th' Boordwa-alk, he t'rew away th' keys, th' Mare did, 'nd says, says he, 'Th' dures won't shtay shutted,' 'nd 'tis a fact, they didn't, they're shwinging arl th' time 'nd whin th' wither gets hot, they're tuk off th' hinges t' save them for th' shtormy winther. He cudn't shut a dure 'nd not hit somebody in th' face, 'nd far be ut fr'm him,' says th' Mare, 'far be ut fr'm him.'

"'Nd y'ought to see th' hot'ls, Dinnissey, 'nd th' Boordwa-alk. Th' Boordwa-alk 's six miles long, 'nd as wide as Halsted street, 'nd it's set up on pegs in th' sand——"

"They's pigs in th' mud on Halsted street," interrupted Mr. Dennissey, "'nd it's twinty-two miles long, 'nd th' boordwalks jump, 'nd they's th' stock——"

"Iv ye intherrupt me story, I'll not take ye with me whin I go with th' McHannix clan," Mr. Hooley replied, crushingly. "On wan'side av th' Boordwa-alk is th' hot'ls, 'nd th' shops where they sill th' pitcher postal ca-ards that Ooncle Sam won't lave go in th' mails, 'nd th' Arminians 'nd Toorks 'nd th' Japs have closin'-out sales ivery day in th' year, 'nd where ivery few minuts ye see a shtrate 'nd aisy way down hill 'nd swingin' dures at th' ind av it that it's aisy to get through whin ye're goin' some. Th' other side's th' ocean, Dinnissey, th' bra-ad 'Tlantic—th' say, th' say, th' open say!' as Barry

Cornwall says, says he, 'th' cereal blue, with sappfire tints whin th' light's good.' What's th' sappfire tints I dinnow, but me poetic frind sid that, 'nd they's tints on the beach that ye'd wish to have fire in iv ye go in bathin' in Joon whin th' wind's wrong. Thin they's th' sand sculptuaries. Th' byes shovel up a hape av sand, 'nd wit ut with wather whin th' tide's in 'nd thin they'll make a sthroke with a trowl on it anny time ye'll throw 'em a nickel. They make hids in th' wit sand 'nd ye can till which is Tiddy be th' tathe 'nd th' gig-lamps, 'nd which is Prisdint Taft or Shakspeare or Abr'm Lincoln by th' name undher ut, 'nd to catch th' nickels they sprid out a sheet, 'nd to catch dimes and quarters they paint on th' sheet, 'To Pay f'r me Univairsity Coorse.' Wan av thim is good at ut. He's been there tin years, 'nd the last time I inquired he'd got so far on his coorse 's to be learnin' spellin' fr'm a sign painter. But I'm thinkin' th' sand 'nd th' wather 'll hold out, 'nd th' nickels, too, iv th' McHannix clan goes there ivery year.

"But th' hot'ls, Dinnissey, 'nd th' boordin' houses. Th' lot av 'em 'll accommodate tree hunthred thousand people iv they'll double up 'nd most av thim do, forby thim that stays on th' Boordwa-alk 'nd takes rooms undther ut. Th' biggest wan 's th' Marlbrew-Blennom, 'nd it's two hot'ls like th' Augitoryum 'nd th' Annix was before they got to fightin' to see which th' tunnel belonged to. But it's laid out like th' streets av Boston, 'nd whin ye think ye're goin' to ye'er room ye a'n't goin' that way at all, at all, 'nd ye don't know where ye are till ye come to th' caffy. Th' passageways arl lead to th' caffy, Dinnissey, 'nd ye can find th' lift whin ye get there. Gin'rally, though, it's because there a'n't much lift that ye get away. Iv ye're stoppin' somewhere ilse th' rollin'-chair man gets th' rist."

"What hot'l 'll ye shtop at?" inquired Mr. Dinnissey.

"Th' Marlbrew-Blennom. Me frind Ta-aylor, that's th' sicriturry av th' McHannix, takes apawtments there. But they's wan big hot'l that's named afther ye, Dinnissey, but that th' say's at th' froont ind instid of behind. Th' Dinnis 's a good hot'l, Dinnissey, 'nd I'll advise ye to stop there. Ye'll have no thrubble findin' ye'er way to th' caffy, f'r they a'n't anny. Th' hot'l belongs to some Shakers fr'm th' City av Broth'ly Love—ye mind th' place where they killed so many min doorin' th' sthrike riots last spring—'nd th' Shakers don't like caffys. There's wan at the Shilburne acrost th' way. That's owned be Honest Jawn Onemaker. He's fr'm th' City av Broth'ly Love, too, but he's that honest himsilf 't he niver thinks av lockin' th' dure, 'nd whin th' Mare threw away th' keys, as I told ye, Jawn he says to th' Mare, says he, 'T'row mine wit 'em, Frank, t'row mine wit 'em," says Jawn.

"Thin they's th' Shawlfont, that's another good hot'l. It's kipt be me friend Bill. He's th' prisidint av th' Hot'l Min's Assoshyation, 'nd they arl stand in wit' Bill. He don't need no caffy. 'Nd arl th' way on th' Boordwa-alk, Dinnissey, fr'm th' Chilsy at wan ind 'nd th' R'y'l Pallis 't th' other, it's hot'ls, 'nd thin some more hot'ls. Ye c'n take ye'er choice 'nd they'll take ye'er money. They're no respictors av persons iv th' persons 've got th' money, 'nd iv ye haven't they don't respict avin ye'er baggage. Behint th' hot'ls they's th' boordin' houses, 'nd thin 'Tlantic Av'noo, 'nd thin th' relrod yards, 'nd thin th' long, low reach av livil bog 'nd sand av Noo Jersey where they raise squabs 'nd muskeeters f'r th' hot'l tables. They're quail on th' meenyoun, 'nd they stack up th' bills in the orfis till ye go away.

"Th' R'y'l Grand Lodge av Emseebees goes t' 'Tlantic City at th' same time," continued Mr. Hooley, "'nd they's an assoshyation that looks afther thim 'nd th' McHannix at th' same time—th' shupply min, that dale in th' things th' relrod min wud have to buy iv they did n't have wint. They're th' dalers, 'nd th' relrod min are th' conshumers 'nd hold hands in th' game. Iv ye go wit' me, Dinnissey, ye'll pretind ye're ayther a shupply man or a relrod man, a daler or a conshumer. Since th' Int'shtate Commerce C'mission 's cut out

th' passes, they's apt to be a little dilicacy among th' conshumers about acceptin' cutsies they can't return, like hot'l bills, 'nd fam'ly expinses, 'nd—other things, fr'm th' dalers that's goin' to thry to sill thim goods f'r th' relrod. Wud ye go as a daler, or as a conshumer, Dinnissey?"

"I'm not that dilikit. 'Tis your 'dale," replied Mr. Dinnissey. "I'll hold me hand 'nd conshume."

"Ye'll not be th' only wan," thoughtfully remarked Mr. Hooley as if to himself.

M. C. B. AIR HOSE RULE.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The English language we may well be proud of. It furnishes words which convey just that shade of meaning to be desired, but in its very richness of expression there lurks a danger. Those who have undertaken to frame a set of rules realize most keenly the care one needs to exercise in selecting these thought conveyers.

The language and general style of the Master Car Builders' rules furnish a splendid opening for the critically inclined. Their defenders would doubtless say the intent of the rules is the meat, and the words only the shell, but how can we reach the one except through the other?

The early M. C. B. rules, like their early framers, were of the rough-and-ready type. The later authors and finishers of these rules have added polish in some cases, but in a commendable desire to be wholly respectful to those whose shoes they have undertaken to fill, the original language, construction and underlying principles are carried forward year by year to a degree which, as an evidence of loyalty to the pioneers, is nothing short of touching. Once in a while—a long, long while—someone who has watched the progress of events urges that a new principle be adopted—a new theory applied. The most effective of punishments—silence—is meted out to him. If any of the self-styled "practical" schools (those

| NAME OF ROAD | | | | | | | | | | 1 1/4 |
|----------------------|----|---|---|---|---|----|----|----|---------------|-------|
| 3—03 | 03 | A | 1 | 2 | 3 | 4 | 5 | 6 | SERIAL NUMBER | |
| | 04 | | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | 05 | R | 1 | 2 | 3 | 4 | 5 | 6 | | |
| | 06 | | 7 | 8 | 9 | 10 | 11 | 12 | | |
| 07 | | | | | | | | | | |
| NAME OF MANUFACTURER | | | | | | | | | | |
| M. C. B. STD. | | | | | | | | | | |

The above gives outline of modification of label. Extension being on right hand end

who have little use for "theory") deign to notice the claims of such a daring individual, it is to dub him "dreamer." For a practical man to dream dreams seems quite impossible, so we proceed to forget the dreamer and he finally wonders how he could have so deluded himself. He wishes only to have his first offense forgiven, and may be counted on to lift no more a voice in favor of any change.

But is not every rule based upon some theory? The early theory of M. C. B. rules was that car interchange was an evil, necessary perhaps, but an evil for all that, and rules calculated in the beginning to make interchange as difficult as possible were formulated. And even today more effort is exerted to fit present conditions to old theories than to fit old practices to new needs. As an illustration let us consider rule 33, the M. C. B. air-hose rule.

Generally speaking, a 1³/₄-in. air hose is standard, and a 1¹/₂-in. air hose is non-standard. An air hose standard as to size becomes non-standard, however, in the absence of a stand-

SERIAL NUMBER
M. C. B. STD.

ard label. Here is a picture of a standard label, without which no air hose is standard:

It is estimated that 1,250,000 freight cars of railway ownership are fitted with standard air hose. That would leave 1,000,000 as having non-standard hose.

The distinction between "standard" and "non-standard" will be pointed out, but, for the present, suffice it to say, there is great variance of opinion as to the correct definition of either term. Decision 799, just issued by the M. C. B. Arbitration Committee expressly to clear up the situation, adds to the feeling of confusion, if possible, rather than removing the doubts that had been entertained.

But of one point there is no room for a difference—namely, rule 33, after many postponements, was adopted, effective September 1, 1909. Under this rule, standard air hose became non-standard at midnight, August 31, of that year. Railway cars fitted with hose, which at 11.59 P. M. were standard and at 12.01 A. M. the following day were non-standard, were located about as follows:

| | No. Cars. |
|------------------------|-----------|
| On home lines | 600,000 |
| On foreign lines | 400,000 |

What is true of the railway car applies also to the private car. On September 1, 1909, it is estimated that 100,000 private cars were away from home, and that at least 40 per cent of these had non-standard air hose. For several years all car owners knew the change from the 1¼-in. to the 1½-in. air hose was coming; indeed, the time set for the change was extended more than once, so as to give every car owner opportunity to meet the requirements. But at the stroke of midnight, August 31, 1909, a great financial responsibility was lifted from the car owner and placed upon the car borrower, notwithstanding all the advance warning the owner had been given. To say that the owner was relieved with respect to equipping every one of these 440,000 non-standard cars would not be entirely true, but to say that the railway or private line that had given least heed to fitting its cars with standard hose profited most by this midnight change would be absolutely true.

If the lines having possession of these 440,000 non-standard cars at the commencement of September 1 had then and there fitted them with standard hose, the owner would have had to pay the bill and this shift of financial responsibility would not have taken place. Such a course was utterly impossible. It would have tied up the transportation system from one end of this country to the other.

It is probably not far from the mark to say that 1,000,000 loaded cars are constantly in transit in this country. Using the estimates that have been made as to the ratio existing between cars fitted with standard air hose and those fitted with non-standard air hose, it would appear that 400,000 loaded non-standard cars were in transit on September 1, 1909, and the act of interchanging one of these transferred the responsibility for the air hose from the car owner to the borrower.

Supposing, for example, that on August 31, 1909, a private line refrigerator car was loaded by the owner, located on the Chicago, Burlington & Quincy, with freight for Boston, routed via the Burlington, Pennsylvania and New York, New Haven & Hartford. Let us say the Burlington delivered the car to the Pennsylvania September 1. On the date of loading the air hose was standard, and on the date of delivery to the Pennsylvania it was non-standard.

Had the Chicago, Burlington & Quincy stopped the car with its freight for Boston and fitted it with standard hose (assuming again the rule is sufficiently clear for even an expert to determine what is standard), the private line (the car owner) would have paid the bill. If the Chicago, Burlington & Quincy did not so equip the car (whether because of having no standard hose at the repair points through which it passed, or to save the delay to the lading), but left the work to be done after the lading was removed, then the car owner is relieved of payment. The New York, New Haven & Hartford, upon

fitting the car with standard hose, bills the Pennsylvania, unless the car carries a Chicago, Burlington & Quincy defect card. The Pennsylvania pays the bill and counterbills the Burlington, and there the matter ends.

From this it will be seen that all, absolutely all, private line cars having non-standard air hose that were away from home on September 1, 1909, have been or will be equipped with standard hose without expense to the owner, unless by chance the road which had possession of the cars on that date equipped them before offering them in interchange.

The theory is that to penalize the Chicago, Burlington & Quincy, in the case cited, for not standardizing the car in transit is good practice. This theory permeates the rules. We have been exceedingly faithful to the early conception of interchange and to the supposed advantage of making it difficult rather than easy.

At the outset it was believed that Rule 33, being a mechanical department rule, affected only the mechanical people. Speedily it was discovered that the rule's influence extended far beyond the department framing it, and affected the movement of traffic. Action of some sort to keep open the avenues of interchange became imperative. Thereupon Rule 33 was studied by the transportation people in addition to the mechanical people. Some understood it one way, and some another. They may be excused for this misunderstanding. The rule says standard hose must be used, but does not say what "standard" is. It contains a footnote that a 1¼-in. hose, if properly branded, shall be considered standard if applied prior to September 1, 1909. This seemed to bar applying any 1¼-in. hose after that date. Some cities figured it out one way and some another. They asked the M. C. B. Arbitration Committee to tell them what is right, and decision 799 was for that purpose.

But to base a good decision on a poor rule is no easy task, and the M. C. B. Arbitration Committee may be excused for recoiling from the thought of framing a definition of "standard." But how about the car interchange inspector—the man on the ground?

It is true the M. C. B. book of diagrams gives a cut of a standard hose. This book is furnished to the general mechanical officers, but not to the men who inspect cars. Word has been passed to the inspectors that the standard effective September 1, 1909, changed from 1¼ to 1½ in. That seemed easy, but is it? A 1½-in. hose not branded to show who manufactured it is non-standard. A 1½-in. hose minus any of the markings is non-standard. A 1½-in. hose with label pasted on it is non-standard. A 1¼-in. hose, with all the necessary brands, if applied since September 1, 1909, is non-standard (or was until decision 799 came out), but if applied before September 1, 1909, is standard. No wonder an interchange inspector has lots to look after. It is a pity he cannot be left free to inspect more for "safety" and less for "protection."

To protect his company from the standpoint of car repair bills, the inspector is forced to inspect the cars minutely, must use great precision and not become confused respecting the rules enacted for protection. To protect his company from the standpoint of making good time on the shipment, he needs only to inspect for safety. If he finds a car equipped with a good hose minus only a portion of the brand, he cannot always bring himself to remove the hose and replace it with one no better, so he sometimes lets the car go forward. Perchance when his company offers the car to another line a defect card is required because one of the marks is missing. If the inspector who passed the car to save delaying its load is reprimanded for letting it come upon the line, he is inclined to take no chances next time, even if he does delay the freight.

When the M. C. B. Arbitration Committee, in February, defined "standard" please note the change they made in the footnote to Rule 33. The footnote of Rule 33 states in substance that a "non-standard" air hose (1¼ in.) will be considered "standard" if applied before September 1, 1909. The interpre-

tation of the Arbitration Committee in decision 799 changes the little word "applied" to read "manufactured"; therefore, a "non-standard," hose under the latest ruling, is "standard" if manufactured prior to September 1, 1909, no matter when applied.

It would appear, therefore, that a standard air hose made non-standard by a technicality may now be replaced by a non-standard hose which has been made standard by a technicality. Please again let sympathy go out to the man on the firing line. He needs a judicial mind in addition to his hammer. His title should be "Judge" rather than "Inspector."

A 1¼-in. hose, if applied any time after September 1, 1909, was non-standard and subject to carding, but on the issuance of decision 799 it became standard. But the most startling feature of decision 799 is that the committee is empowered not only to interpret rules, but empowered also to even change the wording of the rules which they interpret. If the members of the M. C. B. Association frame rules so imperfect that one of their committees must needs change the very language—assuming any committee has such authority—its members, in deep humility, should extend their apology to those railway people who work under M. C. B. rules, and who treat with such dignified consideration rules that would be radically revised except for the inherent conservatism of mankind.

Framed by men who disclaim authority in transportation or traffic matters, the rules constitute one of the most potent factors that exists today in transporting the traffic of this country. Did any one within the limit of his memory ever hear of the framers of the rules of interchange asking for the coöperation of other branches of railway service in formulating rules suited to transportation needs? Is there any one with a memory so exceeding short who has not heard, in one way or another, the wish expressed that the M. C. B. rules of interchange be let strictly alone?

But the rules of interchange are not sacred. Even assuming the rules are based on sound operating and accounting principles, the language used in expressing those principles discredits them. Mechanical men do not—cannot—understand them alike; their meaning is obscure; the language is ambiguous; in many cases, yet a suggestion, however mildly put, however discreetly offered, has served only in the past to start a rumor that certain inalienable rights were being interfered with.

The M. C. B. rules may be treated under two headings, (1) those relating to making repairs to cars, (2) those relating to making an inventory of a car's condition each time it is surrendered by one railway to another railway. The former division should be revised to permit of standardizing repair material and simplifying car repair settlements. The latter must be revised so as to make car interchange easy and inexpensive. There must be less inspection for protection and more inspection for safety. A new theory must permeate the rules of interchange. The movement of cars between railways is now a transportation necessity and the rules must finally be framed to recognize this fact. The M. C. B. defect card will ultimately have to be discarded, just as the passport has ceased to be necessary in order to travel throughout Europe, except in Russia and in Turkey. The country whose people travel least use passports most. Fortunately for America, this abandoned European custom never secured a footing here. But its counterpart, the defect card, is with us and is fastened so firmly upon the American transportation system that there is apt to be as much difficulty in throwing off its evil effects as might be expected in petitioning the authorities of Turkey to abandon the passport system there.

OPERATING OFFICER.

Belgian railway voters going to elections are granted a reduction of 50 per cent, return tickets being available until midnight on the day following election.

BELL TELEPHONE SERVICE ON PIER.

Special arrangements have been made by The Delaware & Atlantic Telegraph & Telephone Company (Bell System) to give the visiting members a thoroughly efficient telephone service. To this end the names of members who register are entered on a telephone list, together with their firm or company connections, the number of their exhibition space, telephone number and hotel address.

This list is used by the operators at the Bell convention exchange located on the pier, to enable them to readily locate any member called.

Everything possible has been done to provide an efficient toll and long distance service. The switchboard which has been installed for the conventions has a capacity of 200 lines and is placed in a private room in order to insure good service. The instruments are of black enamel and have a collecting device for toll and long distance calls. Special Japanese water-proof cord is used in connecting each station, in order to eliminate the effect on transmission caused by the dampness of the sea air.

Over 125 telephones have been installed in the exhibit booths, and besides these there are 10 stations located in prominent positions on the pier to be used for night service.

In addition to the telephones on the pier, members will find them in every room in the large hotels; and, in fact, every where on the island a convenient Bell telephone will be found readily at hand, for there are 6,590 stations in hotels, business places and residences in Atlantic City.

From any one of this large number of telephones a member may reach his home town in a twinkling, for "every bell telephone is a long distance station," and the Bell system connects more than 40,000 cities, towns and villages. A greater number of messages is sent each year by Bell telephone than the combined total of letters, telegrams and railroad passengers.

The publication of the Daily during the convention is greatly facilitated by the Bell service. Our line between the office on the pier and the print shop in Philadelphia is continuously "busy," day and night.

MAIL.

All mail matter addressed to individuals or concerns on the Million Dollar Steel Pier will be distributed from the temporary postoffice located in Secretary Conway's office, at the shore end of Exhibition Hall.

M. C. B. LINE OF MARCH.

Members of the Master Car Builders' Association should note that for the opening session this morning the line of march will be from the entrance of the Marlborough-Blenheim Hotel, down the pier to the Greek Temple. The line will be led by the Old Guard band, and will start at 9.30 A. M. sharp. Similar conditions will govern the march preceding the opening session of the Master Mechanics' Association on Monday morning, except that the course down the pier will be on the other side from that taken today.

On the Belgian state railways, under the law, every railway car, without exception, must be provided with a brake of sufficient power to stop the car without any help from horses or locomotives.

On the Belgian light meter gage railways freight must be taken away from the station within eight hours of time of delivery, night hours and Sundays and holidays being excepted. Demurrage is provided for freight unloaded but not taken away at the rate of two-fifths of a cent per day per \$20 worth of goods. Demurrage for freight not unloaded is charged at the rate of five cents per hour per car.

SPECIAL TRAIN FROM NEW YORK.

Those who came from New York Tuesday afternoon on the Special Train of the C. R. R. of N. J. for the New York Railway Club and its friends were agreeably surprised to find Mr. and Mrs. William McIntosh on board. Mr. McIntosh has spent seven or eight months in Arizona, New Mexico and on the Western Coast of Mexico.

The train consisted of five parlor cars with about one hundred people aboard. The fact that this is smaller than usual is said to be because of the number who have sailed or are about to leave to attend the meeting of the International Railway Congress at Berne, Switzerland.

Among those on the train were Mr. and Mrs. George L. Fowler, Mrs. George E. Molleson, Charles Waughop, B. R. McBain, Supt. of Motive Power, Lake Shore & Michigan Southern Ry.; F. M. Whyte, New York Air Brake Company; George C. Isbester, Q. & C. Company; G. G. Davis, General Foreman Car Department, Cleveland, Cincinnati, Chicago & St. Louis; William T. Henry, New York Air Brake Company; E. L. Janes, American Brake Shoe & Foundry Company; C. E. Chambers, Supt. of Motive Power, Central Railroad Company of New Jersey; George W. Rink, Mechanical Engineer, Central Railroad Company of New Jersey; R. L. Thomas, B. M. Jones & Company; L. F. Purtill, New York Belting & Packing Company, and Miss Purtill; E. A. Robbins; S. D. Anderson, Standard Railway Equipment Company, Mrs. Anderson and Miss Lee; J. A. Warren; E. A. Averill, *American Engineer & Railroad Journal*; George L. Bourne, Railway Materials Company; Mr. and Mrs. C. H. Boaz.

SPECIAL TRAIN FROM CHICAGO.

The Pennsylvania M. C. B. & M. M. special train from Chicago arrived at Atlantic City at 1.50 P. M. yesterday. The special was in charge of George C. Beltzhoover, special agent, passenger department of the Pennsylvania Road, and consisted of one stateroom car, one observation car, one composite club car, six 12-section drawing-room and stateroom cars and two Pennsylvania dining cars. The "happy family" of passengers, consisting of Railway and Supply men, enjoyed a pleasant, though uneventful, trip.

Among those on board were the following: J. F. DeVoy, Mechanical Engineer, Chicago, Milwaukee & St. Paul; C. A. Seley, Mechanical Engineer, Chicago, Rock Island & Pacific; A. E. Manchester, Supt. Motive Power and Machinery, Chicago, Milwaukee & St. Paul; John Ponge, Ex-Master Mechanic and Master Car Builder, Minneapolis & St. Louis; E. A. Gilbert, W. H. Miner Company; E. H. Gold, Chicago Car Heating Company; W. S. Batholomew, Westinghouse Air Brake Company; L. H. Phillips, National Tube Company; M. A. Garrett, M. A. Garrett Manufacturing Company; J. H. Leonard, Bloomington, Illinois; C. R. Blanchard, American Steel Foundries; F. L. DeLong, Chicago Railway Equipment Company; J. J. McCarthy, Chicago-Cleveland Car Roofing Company; William R. Parker, John Lucas Company; John Paige, Inter-Ocean Steel Company; C. B. Young, Mechanical Engineer, Chicago, Burlington & Quincy; F. L. Olds, Chicago Varnish Company; Frank W. Furry, Ohio Injector Company; Mr. Ford, Crerar-Adams Company; W. H. Dangel, Scully Steel and Iron Company; E. R. Hibbard, Grip Nut Company; G. L. Walters, Adams & Westlake Company; W. H. Forsyth, Curtain Supply Company; W. J. Schlacks, McCord & Company; R. T. Brydon, Wadsworth-Howland Company; James Garretson, Acme Supply Company; D. O. Ward, B. O. Osburn Company; J. J. Hennessy, Master Car Builder, Chicago, Milwaukee & St. Paul; George R. Carr, Dearborn Drug & Chemical Works; J. D. Purcell, Dearborn Drug & Chemical Works; J. T. Luscombe, Master Mechanic, Eastern Division of the Toledo & Ohio Central; G. H. Pearsall, Joseph T. Ryerson & Son; W. T. Van Dorn, W. T. Van Dorn Coupler

Company; W. H. Hooper, Chicago Car Heating Company; S. T. Rowley, Waugh Draft Gear Company; Mr. Baker, Murphy Varnish Company; W. A. Smith, *Railway & Engineering Review*; W. E. Magraw, *Railway List Company*; H. O. Procunier, Moon Manufacturing Company; William White, National Boiler Washing Company; G. A. Hagar, Lackawanna Steel Company; C. H. Hobbs, Lackawanna Steel Company; J. M. Brown, Peter Gray Company; E. P. Schmidt, Urbana, Illinois; L. F. Wilson, C. N. Stevenson, E. C. Griffith, C. S. Jones, G. A. Stone, G. J. Hartz, F. W. Edwards, L. R. Wells.

LIST OF EXHIBITORS.

Although the exhibit space has been increased to 71,453 sq. ft. or about 6,000 sq. ft. over that of last year and 13,653 sq. ft. over that of 1908, it was necessary to turn away thirty-five firms who desired to exhibit, but could not be accommodated because of lack of space.

The exhibit space is divided off as shown by the accompanying diagram, and is subdivided, in general, as follows:

| | |
|-------------------------|----------------|
| Main Building | 12,048 sq. ft. |
| Machinery Hall | 12,060 sq. ft. |
| Aquarium Court | 6,233 sq. ft. |
| Exhibition Hall | 12,448 sq. ft. |
| Annex Court | 6,014 sq. ft. |
| Annex | 11,988 sq. ft. |
| Hotel Men's Annex | 10,180 sq. ft. |
| Pier End | 482 sq. ft. |

Total 71,453 sq. ft.

The additional space over last year was gained by moving the Greek temple or convention hall farther out on the pier, and by utilizing every bit of available space between it and the Boardwalk. In the main building the fountain has been removed from the center of the ball room and pergola-like structures have been placed at the sides and the corners. By this arrangement four exhibit spaces have been gained near the stairways without interfering in any way with the effectiveness of the decorations. Noticeable improvements in the arrangement of the exhibit space are the V-shaped fronts to the booths in the Exhibition Hall and the floral decorations in the Annex.

The number of exhibitors has increased from 200 in 1909 to 228 this year. The following list, including the names of the exhibitors, information as to the nature of the exhibits, the names of the representatives and the space numbers, is almost complete.

Owing to the hustling of the committee on exhibits, under the leadership of B. E. D. Stafford, and the competent way in which the secretary of the Railway Supply Manufacturers' Association, J. D. Conway, has handled the details, the exhibit booths are further advanced than at the same period last year; but exhibitors have not been quite as prompt in getting their stuff to Atlantic City as in previous years.

The diagram showing the arrangement of the exhibit space will be found of value in locating any particular exhibit, as the spaces are numbered and the number of each exhibitor's space is shown in the following list:

Acme White Lead & Color Works, Detroit, Michigan.—Railway paints, enamels, colors and varnishes. Represented by D. E. Robinson, K. J. Bowers and H. C. Cater. Space 304.

Adams & Westlake Company, Chicago, Ill.—Electric, gas and oil car lighting fixtures; basket racks; car hardware; white Ajax metal washstands; signal lamps and lanterns; white. Represented by E. L. Langworthy, G. L. Walters, C. B. Carson, F. N. Grigg and E. H. Stearns. Space 405.

American Arch Company, New York, N. Y.—Booth for reception of visitors. Represented by Le Grand Parish, C. B. Moore and J. W. Nicholson. Space 410.

American Balance Valve Company, Jersey Shore, Pa.—Jack Wilson balanced high pressure slide valves; semi plug piston valves; Walschaert valve gear, and Wilson Stevens valve gear. Represented by J. T. Wilson, Frank Trump and C. C. Young. Space 384.

American Brake Company, St. Louis, Mo.—Automatic slack adjuster and flexible metallic joint for use between the engine and tender. Represented by E. L. Adreon. Space 27.

American Car Screen Company.—Space 212.

American Brake Shoe and Foundry Company, Mahwah, N. J.—Locomotive brake shoes; locomotive brake heads; coach brake shoes; car brake shoes. Represented by Otis H. Cutler, J. S. Coffin, J. B. Terbell, F. W. Sargent, E. W. VanHouten, W. S. McGowan, E. L. Janes, E. B. Smith, G. R. Law, R. M. Brower, A. H. Elliot, F. H. Coolidge, R. E. Holt, E. A. Gregory, F. L. Gordon, J. S. Thompson and L. R. Dewey. Space 411.

American Car and Foundry Company, New York, N. Y.—Booth reserved for social purposes only. Represented by Scott H. Blewett, S. S. DeLano, William C. Dickerman, Clark D. Eaton, John McE. Ames, A. E. Ostrander, George A. Johnson, William F. Lowry, H. P. Field, Jr., and William M. Hager. Space 528.

American Car Screen Company, Pittsburgh, Pa.—Adjustable Ventilators. Represented by L. S. Klein. Space 212.

American Engineer and Railroad Journal, New York, N. Y.—Represented by J. S. Bonsall, F. H. Thompson, E. A. Averill and Oscar Kuenzel. Space 22.

American Locomotive Sander Company, Philadelphia, Pa.—Leach locomotive pneumatic track sanders. Represented by Morris B. Brewster, C. B. Ford, C. L. Mellor, J. S. Mace, H. M. Wey and E. Curtiss. Space 427.

American Mason Safety Tread Company, Boston, Mass.—Mason safety treads; Empire treads; Karbolith composition floors for coaches and buildings. Represented by Henry C. King. Space 438.

American Nut and Bolt Fastener Company, Pittsburgh, Pa.—Diamond truck equipped with Bartley positive fasteners; stand showing application of multiple and wood fasteners, and other designs of Bartley fasteners. Represented by Milton Bartley, Harvey Bartley, Edwin M. White, Christopher Murphy and Robert Spencer. Space 320.

American Radiator Company, Chicago, Ill.—Steam and hot water boilers; radiators; tank heaters; hot blast heaters; improved car heaters; packless valves; temperature regulators and automatic air valves. Represented by James H. Davis and J. H. Ives. Space 329.

American Railway Steel Tie Company, Harrisburg, Pa.—Steel ties. Represented by S. S. Blair, Jno. G. Snyder and J. E. Striewig. Space 100.

American Steel Foundries, New York, N. Y.—Andrews side frames; cast-steel bolsters; Simplex bolsters; Susemihl side bearings; springs; brake beams; R. E. Janney coupler; Simplex couplers; Davis steel wheels; Economy draft arms; miscellaneous steel castings. Represented by Wm. V. Kelley, R. P. Lamont, W. W. Butler, Geo. E. Scott, D. W. Call, R. H. Ripley, J. C. Davis, T. D. Kelley, J. V. Bell, G. F. Slaughter, F. K. Shults, W. Ross Gravenor, Geo. C. Murray, P. J. Kalman, Theodore Cook, D. T. Harris, J. W. Dalman, A. R. Brunner, W. A. Blanchard, A. S. Crozier, T. H. Hopkirk, R. E. Janney, P. M. Armendaris, G. G. Floyd, F. B. Ernst, C. E. Bauer, J. Soule Smith and Louis E. Jones. Space 157.

American Vanadium Company, Frick Building, Pittsburgh, Pa.—Vanadium alloys; vanadium iron and steel products, such as railway machinery and engineering steels; vanadium steel forgings; vanadium steel castings; vanadium cast-iron cylinders, bushings, piston rings, valves, etc.; vanadium brass, bronze and aluminum. Represented by James J. Flannery, Joseph M. Flannery, Wm. J. Bird, Geo. L. Norris, C. L. Hastings, R. B. Steele and M. V. Prendergast. Space 211.

Anchor Packing Company, Philadelphia, Pa.—Metal and fibrous packings and mechanical rubber goods. Represented by L. E. Adams and W. R. Haggart. Space 164.

Armstrong-Blum Manufacturing Company, Chicago, Ill.—Marvel power hack saw machines; portable grinders for lathes and planers; lever punches and shears; metallic weather strip for coaches. Represented by Francis J. Blum and George J. Blum. Space 119.

Armstrong Brothers Tool Company, Chicago, Ill.—Tool holders, ratchet drills and machine shop specialties. Represented by Paul Armstrong and James W. Barber. Space 117.

Barco Brass and Joint Company, Chicago.—Flexible joints and steam connections between engine and tender and between cars; exhaust horns and valves for gas and gasoline engines, inspection cars, etc. Represented by F. N. Bard. Space A 2.

Besly & Company, Charles H., Chicago, Ill.—No. 14 Besly spiral disc grinder, Helmet spiral circles, temper taps, oil and babbit. Represented by Edward P. Welles, Charles A. Knill and W. H. Allen. Space 166.

Bettendorf Axle Company, Davenport, Iowa.—One 50 ton, single center sill Bettendorf steel underframe mounted on Bettendorf trucks; one 40 ton, double center sill Bettendorf steel underframe mounted on Bettendorf trucks; one model of all steel box car; one Bettendorf truck for demonstrating how easily same can be assembled and dismantled. Represented by J. W. Bettendorf, E. Bettendorf, J. H. Bendixen, A. F. Macpherson, G. N. Caleb, E. E. Silk, W. G. Ransom and C. J. W. Clasen. Space 200.

Bird & Company, J. A. & W., Boston, Mass.—Repolin signal joint paper; refrigerator felt; red and black paper. Space 425.

Bowser & Company, Inc., S. F., Ft. Wayne, Ind.—Oil storage system complete; long distance, self-measuring pumps; power pumps; automatic registering oil meters; oil storage tanks of all sizes and shapes, with pumps for handling and measuring all kinds of lubricating, paint, and other oils, including gasoline, etc.; suitable for storehouses, machine and paint shops, round houses, engine rooms, signal towers, automobile garages. Represented by C. A. Dunkelberg, L. F. Johnson, W. T. Simpson and F. T. Hyndman. Space 30.

Boyle & Company, Inc., John, New York, N. Y.—Bayonne roof and deck cloth, a scientifically treated cotton duck for car roofing; cotton ducks, cotton drills and sheetings for head linings, upholstering, etc. Represented by E. L. Dayton and W. F. O'Connor. Space 318.

Brill Company, J. G., The, Philadelphia, Pa.—Brill No. 27-M. C. B. 3 truck, a Master Car Builders' type of truck for high speed electric and steam passenger service; solid forged wheel pieces, including pedestals; woven cane, canvas lined and unlined, for car seats. Represented by J. W. Rawle, W. H. Heulings, Jr., A. H. Pease, S. M. Wilson and J. N. Nind, Jr. Space 403.

Brown Automatic Hose Coupler Company, Cleveland, Ohio.—Hose couplers. Space 316.

Buck Boring Bar Company.—The Buck boring bar. Space 155.

Buckeye Steel Casting Company, Columbus, Ohio.—Major, Columbia and Universal couplers; truck and body bolsters; truck frames; journal boxes; pivoted yoke. Represented by J. C. Whitridge, Geo. Groobey, G. T. Johnson and F. L. Allcott. Space 511.

Buffalo Brake Beam Company, New York, N. Y.—Brake beams for all classes of cars, locomotives and electric equipment, meeting Master Car Builders' standards and railway companies' requirements. Represented by S. A. Crone, Edwin Strassburger, Thomas E. Carliss, Roland C. Fraser, C. E. Barrett and C. J. Zacher. Space 490.

Burroughs Adding Machine Company, Detroit, Mich.—Burroughs adding machine, electrically driven, for railroad accounting. Represented by F. A. Willard, E. G. Griffith and A. H. Cato. Space 480.

Butler Drawbar Attachment Company, Cleveland, Ohio.—Friction draft gear; Piper patents for 9½ yoke; the same for 6½ yoke narrow sill spacing; Piper's patents combined with Farlow attachment; Tandem spring draft gear. Represented by Geo. L. Weiss and W. B. Waggoner. Space 317.

Buyers' Index Company, Chicago, Ill.—Purchasing agents' buying list. Represented by Lloyd Simonson, B. J. Beaton, F. B. Cozzens and Mr. Frame. Space 35.

Carborundum Company, Niagara Falls, N. Y.—Carborundum and Aloxit wheels, sharpening stones, rubbing bricks; Carborundum paper and cloth; Garnet paper; Carborundum valve grinding compound. Represented by George R. Rayner, C. C. Shoemaker, Charles Nicholson, R. H. Hogg and C. C. Lathrop. Space 103.

Cardwell Manufacturing Company, Chicago, Ill.—See Union Draft Gear Company. Space 476.

Carnegie Steel Company, Pittsburgh, Pa.—One section of standard railway track laid with 100 pound rails and Duquesne joints on steel cross ties, with various type fittings; one section portable track for industrial railways laid on steel cross ties; various samples of rails, cross ties and Duquesne joints; nickel-plated samples steel sheet piling; pyramid of spike and bolt kegs bound with patent steel hoops; pair of high record Schoen freight car wheels; 33-in. Schoen steel engine truck wheel with large back hub; 36-in. Schoen passenger train car wheel; 33-in. Schoen tender truck wheel; 34-in. Schoen steel wheel for street railways; 34-in. Schoen steel wheel for interurban railways; 33-in. freight car wheels rolled to a finish—one made by the Schoen process and one made by the Slick process of manufacture; exhibit of soft

welding and threading steel, composed of car truck section, arch bars, locomotive and car forgings, with samples of screw stock. Represented by H. P. Bope, Sam'l A. Benner, John C. Neale, W. G. Clyde, L. C. Bihler, W. A. Bostwick, E. E. Slick, John McLeod, E. S. Mills, R. B. Woodworth, V. S. Yarnall, N. B. Trist, John W. McGrady, L. W. Conroy, W. F. Evans, Charles Orchard and James B. Bonner. Space 412.

Carter Iron Company, Pittsburgh, Pa.—Stay-bolt iron, chain cable iron, engine bolt iron. Represented by Christopher Murphy and Robert Spencer. Space 21.

Celfor Tool Company, Chicago, Ill.—Celfor high-speed drills, reamers, countersinks, three-lipped drills, Rich flat drills, Celfor duplex and precision chunks, reamer sockets, etc. Represented by E. B. Clark, William Brewster, M. L. Hanlin, J. J. Dale, Chas. A. Bucher and Edwin B. Ross. Space 133.

Central Electric Company, Chicago, Ill.—Okonite wires, cables, cords and tapes, car fans, wall, oscillating and exhaust car lamps; tungsten, tantalum and gem shallow flush switches; train connections with automatic runaround opalus shade. Represented by Charles E. Brown, J. M. Lorenz and D. Woodhead. Space 335.

Chase & Company, L. C., Boston, Mass.—Goat brand car plushes in plain and frieze effects; Angora mohair showing process of manufacture; Chase's car seat duck. Represented by Frank Hopewell, R. R. Bishop, Jr. and W. P. Underhill. Space 10.

Chicago Pneumatic Tool Company, Chicago, Ill.—Air compressor and four special drills. Represented by Thomas Aldcorn, C. E. Walker, G. A. Barden and A. B. Inness. Space

Chicago Car Heating Company, Chicago, Ill.—Vapor system of car heating; atmospheric pressure heating system; multiple regulation heating system; heating systems for sleeping cars, private cars and special cars; steam-hose couplers; end train-pipe valves; control valves; supply valves; cut-out valves; vertical steam traps and car heater fittings. Represented by Egbert H. Gold, Jos. E. Buker, Thos. F. Downing, Frank F. Coggin, Edw. A. Schreiber, W. H. Hooper, B. A. Keeler, Eugene E. Smith, C. B. Benson and J. R. Reniff. Space 224.

Chicago Railway Equipment Company, Chicago, Ill.—Brake beams of the "P. C." Creco, "E. L." Creco, Creco, Diamond, National Hollow, Kewanee, Drexel, Reliance, Sterlingworth, Ninety-six and Monarch types; Monitor bolsters; Creco roller side bearings; Creco slack adjuster; Creco journal box and lid; automatically adjustable brake heads; Riglo removable leads. Represented by E. B. Leigh, Arthur Wyman, F. T. DeLong, F. G. Ely, B. F. Pilson, Raymond H. Pilson, G. A. Sweringer, C. P. Williams and C. H. Williams, Jr. Space 505.

Chicago Steel Car Company, Chicago, Ill.—Models of tank car, steel underframes and reinforcements. Represented by J. E. Chisholm and H. C. Priebe. Space 435.

Chicago Varnish Company, Chicago, Ill.—Car sides, showing "Ce Ve Process" of saving in cost of painting cars. Represented by O. H. Morgan, O. R. Ford, T. M. Murray, Geo. S. Bigelow and F. L. Olds. Space 482.

Chisholm & Moore Manufacturing Company, The, Cleveland, Ohio.—Complete line of our cyclone high-speed chain hoists, from ½-ton to 30-ton, inclusive; also some of our matchless I beam trolleys; a working model of our 5-ton cyclone hoist with cover removed, showing the internal construction of this hoist. Represented by H. E. Dickerman and W. E. Ludlow. Space 45.

Cleveland Car Specialty Company, Cleveland, Ohio.—Pressed steel carlines for freight cars; pressed steel end tie bands for freight cars; pressed steel side posts, window posts, door posts; upper and lower deck carlines, main carlines, etc., for passenger cars; pressed steel carlines for baggage and express cars; pressed steel spring plank for car and tender trucks; pressed steel automobile side frames and braces. Represented by Geo. L. Weiss, W. S. Bidle, Jos. A. Costello and W. B. Waggoner. Space 317.

Clow, James B. & Sons, Chicago, Ill.—Automatic closets; drinking fountains; lavatories; Triumph heaters for signal cabins; Buena radiators. Represented by J. L. Ponie and L. J. Elliott. Space 420.

Coe Brass Manufacturing Company, The, Ansonia, Conn.—Extruded metals in great variety of intricate designs especially adapted to railway car construction and ornamentation; also for use in electrical and other apparatus. Represented by E. J. Steele, Charles E. Van Riper, William W. Cotter and William H. Rippere. Space C.

Coe Manufacturing Company, W. H., Providence, R. I.—Coe's ribbon gold leaf and Coe's gilding wheels. Space D 2.

Commercial Acetylene Company, The, New York City, N. Y.—Acetylene headlights; markers and tail lights for locomotives; acetylene signal lamps and car lighting system; acetylene safety storage tank, showing asbestos packing; flashing apparatus as used by U. S. Government for buoys, beacons and lighthouses, with sun valve, which automatically shuts of and turns on the gas. Represented by H. G. Doran, R. J. Faure, Oscar F. Ostby and E. T. Sawyer. Space 201.

Commonwealth Steel Company, St. Louis, Mo.—Catalogues; printed matter; models, etc. Represented by H. M. Pflager, Geo. E. Howard, Boone V. H. Johnson, Frank S. Barks and C. F. Frede. Space 315.

Consolidated Car-Heating Company, Albany, N. Y.—Steam couplers with automatic locks; steam traps, both vapor and pressure; electric heaters and switches for 600 and 1,200 volt operation; automatic safety train signal; consolidated buzzer system; electric boilers. Represented by Cornell S. Hawley, W. S. Hammond, Jr., Thomas Farmer, Jr., and H. L. Hawley. Space 460.

Consolidated Railway Electric Lighting and Equipment Company, New York, N. Y.—Type "d" equipment 4 K. W., capacity for either 60 or 30 volts in connection with Kennedy regulator. Type "F" equipment 2 K. W., capacity for 60 or 30 volts in connection with Kennedy regulator, besides separate parts of all machines showing their construction. Represented by P. Kennedy, J. L. Watson, Thos. L. Mount, L. J. Kennedy and W. R. Hungerford. Space 449.



Continental Railway Equipment Company, Chicago.—The Murray draft gear. Represented by George C. Murray. Space 323.

Cooper Hewitt Electric Company, New York, N. Y.—Mercury vapor lamps and rectifier for operating same. Represented by J. P. O'Shea, F. R. Fortune, F. M. Haviland and M. B. Buckman. Spaces 27 and 136.

Crane Company, Chicago, Ill.—Cranetilt steam traps; motor operated valve; Crane blow-off valve; locomotive safety valve; locomotive cab hose valves; automatic quick opening locomotive blower valves; locomotive cab valves; brass valves of all kinds; malleable and cast-iron fittings. Represented by F. D. Fenn and G. S. Turner. Space 321.

Crosby Steam Gage and Valve Company, Boston, Mass.—Locomotive safety valves, gages and blow-off valves; Testing instruments. Represented by E. C. Kenyon, J. J. McCormick and A. B. Carhart. Space 429.

Curtain Supply Company, The, Chicago, Ill.—88 ring fixtures; 86 roller tip fixtures; full line of curtain materials; "CSCO," "REX" and "VICTOR" diaphragms; Number 6 roller bearing hooks, and automatic releasable handles for vestibule passageway curtains. Represented by W. H. Forsyth, R. F. Hayes and S. W. Midgley. Space 469.

D. r. Company, New York, N. Y.—Dust guards. Space 238.

Damascus Brake Beam Company, Cleveland, O.—"Waycott Special" high speed beams; Waycott freight beams (Nos. 1 and 2); all steel trussed beam with forged steel heads and forged steel fulcrum (no castings); adjustable brake heads, etc. Represented by Albert Waycott, P. T. Handiges and E. S. Smith. Space 501.

Davis Solid Truss Brake Beam Company, Wilmington, Del.—Davis solid truss brake beams; solid steel brake shoe backs; Davis universal air brake; specially designed deflectionometer for accurately measuring deflection of brake beams. Represented by Nathan H. Davis, Thos. C. Davis, C. Theo. Buchholz and Chas. F. Perkins. Space 414.

Dearborn Drug & Chemical Works, Chicago, Ill.—Water treating preparations for the prevention of scale, leaking, foaming and corrosion in locomotive boilers; waters analyzed and treatment specially prepared to suit conditions. Represented by George R. Carr, Grant W. Spear, J. D. Purcell, A. W. Crouch, W. S. Reid and H. G. McConaughy. Space 8.

Detroit Hoist and Machine Company, Detroit, Mich.—Pneumatic and electric turntable tractors; geared pneumatic hoists. Represented by J. C. Fleming and Frank B. Fleming. Space 109.

Detroit Lubricator Company, The, Detroit, Mich.—Locomotive lubricators, Numbers 0, 5, 11, 21, 31, 41 and 61; single, double and quadruple feed types of sight feed air cylinder lubricators; transfer system for filling lubricators; visible sight feed guide cups; automobile and gas-engine mechanical valveless force feed oil pumps. Represented by F. W. Hodges, Herbert I. Lord and A. D. Homard. Space 15.

Dickinson Inc., Paul, Chicago, Ill.—Dickinson cast iron smoke jack; fire-proofed wood smoke jack; cast iron ventilators; cast iron chimneys. Represented by W. E. Chester, A. J. Filkins, Edward W. Hodgkins and J. A. Meaden. Space 231.

Disston & Sons, Inc., Henry, Philadelphia, Pa.—Metal cutting saws and hand saws of all kinds; regular and superfine files; try squares; screwdrivers and spirit levels. Represented by Geo. Koon, W. T. Lindsey and E. A. Platt. Space D 1.

Dixon Crucible Company, Joseph, Jersey City, N. J.—Graphite products especially adapted for railroad work, including the Dixon pure flake lubricating graphite; graphite greases; silica-graphite paint; crucibles; belt dressings and pencils. Represented by Wm. J. Coane, H. A. Nealley, R. R. Belville, F. R. Brandon, J. J. Tucker, Wm. A. Houston, H. W. Chase and L. H. Snyder. Space 24.

Dressel Railway Lamp Works, The, New York, N. Y.—Locomotive headlights; engine classification lamps; train tail lamps; coach lamps; switch lamps; semaphore lamps; caboose lamps; station lamps; gauge lamps. Represented by F. W. Dressel, Robert Black, H. S. Hoskinson, F. W. Edmunds, Edward W. Hodgkins, B. P. Claiborne and M. B. Williston. Space 383.

Duff Manufacturing Company, The, Pittsburg, Pa.—Barrett track jacks; automatic lowering jacks; geared ratchet jacks; Duff ball bearing screw jacks; Duff-Bethlehem hydraulic jacks; Independent pump hydraulic jacks. Represented by T. A. McGinley, G. A. Edgin and E. A. Johnson. Space 508.

Duntley Manufacturing Company, Chicago.—Duntley pneumatic en-route car cleaner; Duntley air purifier for passenger coaches. Represented by G. A. Graber, A. S. Foote and G. P. Foute. Space 521.

Durbin Automatic Safety Car Coupler Company, The, Fort Scott, Kans.—Automatic safety car coupler or draw bar. Represented by C. T. Hunn, V. S. Durbin and J. F. Durbin. Space 107.

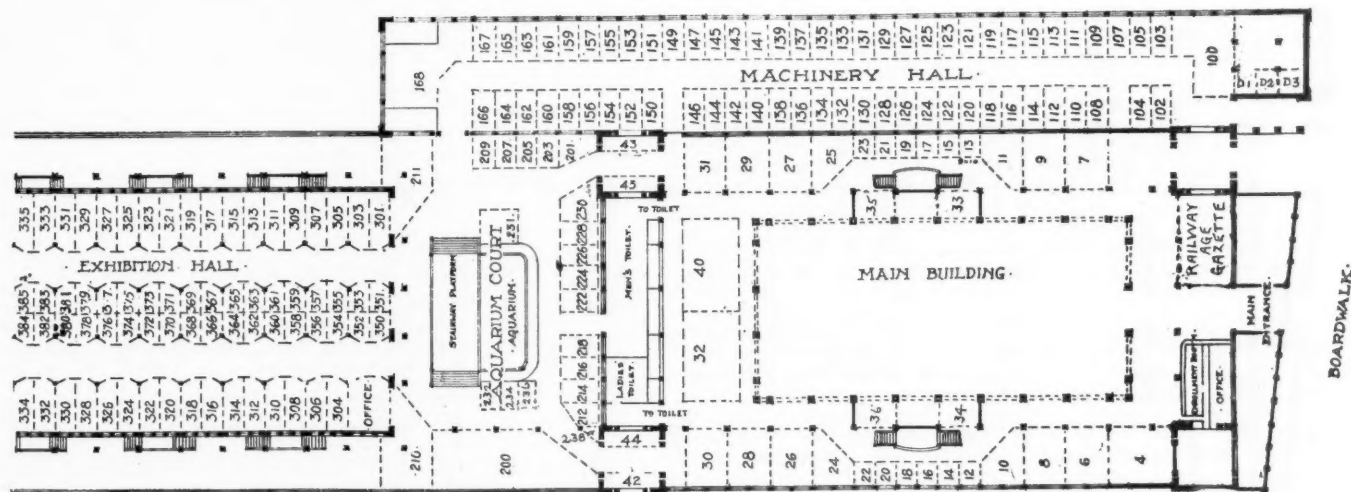
Edwards Company, The O. M., Syracuse, N. Y.—Car window fixtures; sash balances; shade rollers; metal cash; metal trapdoors; sheet metal specialties and railroad padlocks. Represented by O. M. Edwards, E. F. Chaffee, J. J. Edwards, C. H. Rockwell, W. C. Bradbury, E. W. Edwards, 2d, Harold Edwards and T. P. O'Brian. Space 6.

Electric Hose & Rubber Company, Wilmington, Del.—Braided fabric rubber hose. Represented by A. W. Archer, Jr., Wm. M. Sibley, E. F. Brownworth, C. R. Blanchard, C. D. Garretson and J. DeW. Archer. Space 378.

Electric Storage Battery Company, The, Philadelphia, Pa.—Storage batteries for car lighting, signal, vehicle propulsion and automobile ignition service. Represented by J. R. Williams, Charles Blizard, E. L. Reynolds, F. L. Kellogg and H. E. Hunt. Space 409.

Faessler Manufacturing Company, J., Moberly, Mo.—"Boss" improved sectional tube expanders and the Smith driving box. Represented by J. W. Faessler, C. F. Palmer and L. K. Smith. Space 417.

Fairbanks, Morse & Company, Chicago, Ill.—Gasoline section and inspection motor cars; telescopic standpipe and sectionalized valve; chain hoists; tools; rail drills; power pump and motor; line of Geared Ratchet; Ratchet; ball and cone bearing screw jacks and hydraulic jacks. Represented by A. A. Taylor, Geo. J. Akers, E. M. Fisher, F. M. Condit and A. C. Dodge. Space 510.



Flannery Bolt Company, Pittsburgh, Pa.—Tate flexible staybolts; installation tools for applying Tate bolts; radial crown stays and button head crown stays; "F. B. C." nut locks. Represented by B. E. D. Stafford, Geo. E. Howard, Tom R. Davis, Barton H. Grundy, J. Rogers Flannery, Wm. M. Wilson and Thos. J. Leahey. Space 442.

Flower Waste & Packing Company, New York, N. Y.—Resilient journal packing. Represented by Frank D. Waller and George T. Hanchett. Space 308.

Ford & Johnson Company, The, Michigan City, Ind.—Car seats of various types; cane webbing used in car seats; reed and fibre rush chairs for railroad service. Represented by A. D. Martin, G. T. Paraschos, Wm. E. Murphy, B. H. Forsyth and C. A. VanDerveer. Space 314.

Foster, Walter H., New York, N. Y.—Bolt turning machine; staybolt threading and reducing machine; one Potter & Johnson bolt altering machine; staybolt drilling machine; automatic nut-tapping machine; one chaser grinder; lathe dog. Represented by Walter H. Foster and C. K. Lasseter. Space 110.

Forsyth Brothers Company, Chicago.—Forsyth centering device; friction draft gear; cast steel yoke for freight cars; pressed steel doors; Brinkerhoff side construction for passenger cars; pressed steel mouldings and sash. Represented by A. H. Sisson and Mr. Davidson. Space 472.

Franklin Manufacturing Company, Franklin, Pa.—85 per cent magnesia boiler lagging and pipe coverings; corrugated asbestos roofing or sheathing; asbestos "Century" shingles and asbestos building lumber; asbestos "Century" smoke jacks; "Ambler" asbestos ring air pump and throttle packings; asbestos pipe coverings, and asbestos supplies; "Springtite" corrugated copper gaskets; composition metallic gaskets; "Chapman" circular glass cutter; Perfection journal box packing; wool and cotton waste. Represented by R. J. Evans, E. R. Rayburn, L. B. Melville, Geo. S. Stuart, H. S. Hayward, Jr., and Fred Alford. Space 25.

Franklin Railway Supply Company, New York, N. Y.—Booth containing files of daily papers from different parts of the United States. Represented by J. S. Coffin, Samuel G. Allen, A. G. Elvin, C. L. Winey, R. G. Coburn and W. L. Allison. Space 410.

Frost Railway Supply Company, The, Detroit, Mich.—Harvey friction spring gears in different sizes; Detroit metal weather strip. Represented by Harry W. Frost, George A. Cooper and George L. Harvey. Space 578.

Galena-Signal Oil Company, Franklin, Pa.—Reception booth. Represented by S. A. Megeath, C. C. Steinbrenner, E. V. Sedgwick, Harry Hillyer, J. W. Bunn, E. H. Baker, J. P. Ferguson, F. A. Guild, B. H. Grundy, A. I. Gifford, E. W. Grieves, Wm. Holmes, E. G. Johnson, Geo. L. Morton, W. E. Maher, Robert McVicar, L. H. Palmer, J. S. Patterson, P. H. Stack, W. A. Trubee, W. J. Vance, John A. Wilson and W. J. Walsh. Space 32.

Garlock Packing Company, The, Palmyra, N. Y.—Throttle packing; air pump packing; new process sheet packing; new process gaskets; metal packing; hydraulic packing and steam hammer packing. Represented by H. N. Winner, F. S. Bulkley, Philip Arnold and F. P. Dunham. Space 424.

General Electric Company, Schenectady, N. Y.—Portable air compressor (100 lbs. pressure) with pressure regulator; 12 ampere G. I. flaming arc lamps; 6½ ampere multiple magnetite arc lamps; 6½ ampere intensified arc lamps; "Mazda lamps; monogram sign with lamps; Curtis turbo generator for car lighting; cabinet containing an exhibit of train lighting lamps; mercury arc rectifier; 25 Kw. hardening furnace; emery grinder; motor generator set with starting and field rheostats; soldering irons; glue pot; solder melting pot; oil tempering bath; G. E. 212 railway motor; KT-BD-2 motors; motor driven machine tools; switchboard. The apparatus will be shown in operation. Represented by W. J. Clark, J. G. Barry, C. E. Barry, H. L. Monroe, C. A. Raymond, R. E. Moore, W. O. Kellogg, C. C. Pierce, H. D. Hawkes, Frank H. Gale, A. J. Totten, and W. S. Taussing. Space 350.

General Railway Supply Company, Chicago, Ill.—Stub end of a vestibuled passenger car and working models of railway car devices, as follows: Metallic (steel) sheathing; National steel trap doors; Flexolith composition flooring; Imperial car window screens; Perfection sash balances; Resisto insulation; roller deck sash ratchets; National standard roofing; National vestibule curtain catches. Represented by F. L. Wells, H. U. Morton, W. S. Humes and J. F. Oelerich. Space 158.

Gilbert & Barker Manufacturing Company, New York, N. Y.—Self measuring pumps; oil storage tanks; oil storage systems for oil houses, store rooms, etc.; siphons; transfer pumps; storage indicators and lubricating oil tanks. Represented by C. F. Hatmaker. Space 406.

Gold Car Heating & Lighting Co., New York, N. Y.—Car heating and lighting apparatus and car ventilators. Represented by E. B. Wilson, A. B. Strange, W. H. Stocks, Geo. F. Ivers, J. M. Stayman, J. O. Brombaugh, F. H. Smith, F. A. Purdy,

Goldschmidt Thermit Company, New York, N. Y.—All materials required for making welds on locomotive frames, driving wheel spokes, connecting rod and other broken wrought iron and steel sections; samples of welds made on steel bars, trolley rails; standard and extra heavy pipes, etc. Metals free from carbon produced by the Thermit process, including chromium, manganese, molybdenum manganese-copper, manganese-tin, manganese-zinc, ferro-titanium, chromium-copper, manganese-boron, ferro-boron. Cans of heating thermit for reviving dull iron in the ladle, making semi-steel, keeping metal in risers liquid, etc.; cans of titanium thermit for purifying molten iron, increasing its fluidity and enabling the pouring of castings of greater density and higher quality. Represented by H. S. Mann and Wm. Aldrich. Space 324.

F. T. Kitchen and E. J. Roman. Space 301.

Gould Coupler Company, New York, N. Y.—M. C. B. Couplers; Gould malleable iron journal boxes; freight friction draft gears; passenger friction draft gears; Hartman ball bearing centre plates and side bearings; Gould cast steel side frames; passenger cast steel end sill with friction buffer; passenger couplers; steel draft beams; Moritz coupler; cast steel truck bolsters; Gould cast steel freight end sill with friction back of coupler horn; pin type coupler and friction draft gear; Gould cast steel draft beams with friction draft gear; couplers and friction striking plate; 80,000 lb. freight truck with cast steel side frames; angle iron ties; 5 x 9 journal boxes; truck bolster; 5 x 9 axles; Gould car lighting equipment and storage batteries. Represented by F. P. Huntley, Geo. G. Milne, H. N. Loomis, C. E. Rood, W. F. Richards and Dr. C. W. Gould. Space 441.

Greene, Tweed & Company, New York, N. Y.—Palmetto packing; favorite reversible ratchet wrenches. Represented by H. S. Dearmest, F. E. Ransley and B. M. Bulkley. Space 43.

Grip Nut Company, Atlantic City, N. J.—Grip nuts. Represented by E. R. Hibbard, pres.; J. W. Hibbard, treas.; B. C. Wilt, J. W. Cuddy and E. A. Magurn. Space 520.

Hale & Kilburn Manufacturing Company, The, Philadelphia, Pa.—Seats for all standard types of railway cars; all-steel seats for steel cars; reclining seats for chair cars; steel interior finish; steel doors; steel sash; everything in steel for the interior of the modern steel passenger car. Represented by H. T. Bigelow, A. F. Old, B. F. Pilson and C. W. Laskay. Space 504.

Hammett, H. G., Troy, N. Y.—Trojan metallic packing; Trojan bell ringers; radius grinder; triple valve bushing roller. Represented by H. G. Hammett, E. C. Sawyer and A. O. Van Dervort. Space 147.

Harlan & Hollingsworth, Wilmington, Del.—One finished steel coach and one steel coach frame. On exhibit track.

Harrington, Son & Co., Inc., Edwin, Philadelphia, Pa.—Peerless hoists; screw hoists; differential hoists; plain and geared travelers to run on lower flange of I-beam. Represented by Roger Sherron, W. J. Somerset, J. A. Slaughter, M. W. Christian and A. M. Harrington. Space 129.

Heywood Bros. & Wakefield Company, Wakefield, Mass.—New complete line of universal car seats, showing latest pressed steel features. Represented by Bertram Berry, R. F. Fowler and E. C. Lang. Space 386.

Hobart-Allfree Company, The, Chicago, Ill.—A working model of a locomotive, ¼ size, showing the running gear complete and demonstrating the Allfree system of cylinders, valves and new radial outside valve gear. Represented by J. B. Allfree, Frank Smith and W. H. Belmaine. Space 436.

Home Rubber Company, Trenton, N. J.—Black sheet packing; high and low pressure diagonal rod packing; hydraulic packing; flax packing; gum core packing; ring and combination packings. Represented by A. R. Foley. Space 333.

Hunt-Spiller Manufacturing Corporation, South Boston, Mass.—Hunt-Spiller gun iron castings which have been in service and removed for exhibition purposes, such as piston valve rings; piston valve bushing; cylinder packing rings; eccentrics and eccentric straps; crosshead shoes; driving box. Also Hunt-Spiller gun iron castings in the rough, such as

- superheater header; piston head; gear, etc. Represented by Frederic Parker, W. B. Leach, J. G. Platt and A. J. O'Connor. Space 474.
- Hutchins Car Roofing Company, Detroit, Mich.—Samples of roofing sheets and photographs of cars equipped with the Hutchins roofing. Also track exhibit in the P. & R. R. R. side tracks showing N. Y. Central & Hudson River R. R. car No. 106,986 equipped with Hutchins all-steel steel carline roof. Represented by D. W. Hawksworth and W. D. Thompson. Space 431.
- Independent Pneumatic Tool Company, Chicago, Ill.—Thor piston air drills; pneumatic riveting, chipping, caulking and flue-beading hammers; the Thor stay-bolt driver. Represented by James B. Brady, W. O. Jacquette, J. D. Hurley, R. S. Cooper, Geo. A. Gallinger, R. T. Scott, F. W. Buchanan, J. J. Keefe, H. F. Finney, T. J. Carroll and J. P. Bourke. Space 486.
- International Correspondence Schools (Railway Department), Scranton, Pa.—Booth attended by students from various Southern railway apprentice instruction classes exhibiting specimens of the work of the students in mathematics and mechanical drawing. Represented by W. N. Mitchell, Ed. M. Sawyer, R. S. Mitchell, G. B. Moir, J. F. Cosgrove, A. E. Sweet, J. E. Drennan, G. H. Brown and N. B. White. Space 26.
- Jenkins Brothers, New York, N. Y.—Jenkins Bros. brass globe valves, regular and extra heavy; brass gates, medium and extra heavy; brass "Y" valves, regular and extra heavy; automatic Graber gauges; radiator valves and air valves; iron body globes, gates, etc.; safety car discs; "96" packing; pump valves and Jenkins discs. Represented by A. C. Langston, Frank Martin, C. B. Yardley, Jr., and B. J. Neely. Space 421.
- Johns-Manville Company, H. W., New York, N. Y.—High and low pressure sheet; packings; high and low pressure pipe; coverings; insulating cements; refrigerator car insulation; steel passenger car insulation; asbestos roofings; car and engine cab roofings; asbestos smoke jacks; asbestos lumber; electrical fibre conduit; underground pipe covering; J-M sanitor seats and tanks; vulcabeston throttle and air pump packing; vulcabeston caskets; locomotive boiler laggings; vitribestos pipe coverings; bridge deckings; J-M asbestos sill covering; train pipe coverings; furnace cements. Represented by J. E. Meek, mgr., J. C. Younglove, G. A. Nicol, H. G. Newman, F. M. Gilmore, Geo. Christenson and C. W. Gearhart. Space 492.
- Joliet Railway Supply Company, Joliet, Ill.—Huntoon light and heavy freight brake beams; special freight brake beams; locomotive and passenger brake beams; all steel brake beams; "P. C." and "L. N." high-speed beams; standard U freight beams; Perry passenger and freight roller side bearings, both new and after service. Represented by H. M. Perry, C. A. Huntoon, E. A. Laughlin, J. D. Granville, W. C. Munn and R. C. Fraser. Space 526.
- Joyce-Cridland Company, The, Dayton, O.—All types of railroad jacks. Represented by Geo. M. Llewellyn, Edwin Romeiser, P. J. Ford and Nicholas Kohl. Space 444.
- Kelly-Arnold Manufacturing Company, Wilkes-Barre, Pa.—Automatic air and steam connector; metal conduits and auxiliary parts. Represented by George F. Royer and John J. O'Donnell. Space 210.
- Kerite Insulated Wire and Cable Company, New York, N. Y.—Kerite insulated wires and cables; kerite tape. Represented by R. D. Brixey, Azel Ames, P. W. Miller and J. A. Renton. Western representatives, Watson Insulated Wire Company, J. V. Watson, B. L. Winchell, Jr., R. A. Patterson, Chicago. Space 413.
- Keystone Drop Forge Works, Chester, Pa.—Keystone connecting links; safety shackle hooks; wrenches; hoist hooks; shafting collars; thumb screws; thumb nuts; eye bolts; machine handles; special drop forgings. Represented by Geo. H. Berlin and Chas. F. H. MacLaughlin. Space 325.
- Keystone Lantern Company, Philadelphia, Pa.—The Casey standard railway hand-lantern. Space 428.
- Kilbourne & Jacobs Manufacturing Company, Columbus, Ohio.—Automatic M. C. B. air dump construction car. Represented by F. W. Hubbard and A. C. Stansill. On exhibit track.
- King Automatic Car Platform Company, Inc., Washington, D. C.—Models of sliding platform extensions for passenger coaches of steel, steel underframe or wooden construction. Represented by J. C. Mayo. Space 327.
- Lackawanna Steel Company, New York, N. Y.—Rails; rail joints; tie plates; beams; channels; angles; steel plate; steel forging; corrugated and deformed bars; twisted squares; the Abbott base plate; sheet piling. Represented by F. E. Abbott and A. H. Weston. Space 40.
- Landis Machine Company, Waynesboro, Pa.—Double head motor driven bolt threading machine; single head open belt type high speed bolt threading machine; automatic die head for turret lathe; semi-automatic die head for pipe threading machines, and demonstrations of thread cutting and samples of threaded products. Represented by J. G. Benedict, Ira D. Grove and H. L. Fisher. Space 108.
- Landis Tool Company, Waynesboro, Pa.—Cylindrical grinders; one gap grinder 16 x 72 in operation, made for railroads; one number 2 universal grinder. Represented by J. H. Hollinger. Space 102.
- Linde Air Products Company, Buffalo, N. Y.—Oxy-Acetylene welding and Oxy-Coal gas cutting apparatus and wrecking equipment. Represented by G. E. Kershaw, F. Schoonmaker, J. A. Warfel, M. S. Plumley, E. E. Radcliffe and W. J. Fritz. Space 500.
- Love Brake Shoe Company, Chicago, Ill.—Armbrust brake shoes for driver brakes, passenger, freight and coach brakes; also motor brake and traction brake shoes. Represented by C. W. Armbrust and John F. Stevens, Jr. Space B.
- Lunkenheimer Company, Cincinnati, Ohio.—Engineering specialties, including brass and iron gate, globe, blow-off and swing check valves. Represented by C. Davies, E. R. Ritter and William Hood. Space 26.
- Lupton Sons Company, David, Philadelphia, Pa.—Lupton rolled steel skylight; Lupton steel sash; Pond continuous sash and Pond operating device for pivoted sash. Represented by Clarke P. Pond and H. R. Wilkinson. Space 422.
- Macleod & Company, Walter, Cincinnati, Ohio.—Lights for wrecking outfits and construction work; portable oil burners; sand blast machines; oil furnaces; tire heaters; water softening apparatus. Represented by Walter Macleod, F. A. Saylor, P. H. Wilhelm, W. B. Woodbridge and William Hext. Space 503.
- Manning, Maxwell & Moore, Inc., New York, N. Y., and its subsidiary companies, The Hancock Inspirator Company, The Ashcroft Manufacturing Company, The Consolidated Safety Valve Company, The Hayden & Derby Manufacturing Company, and The Shaw Electric Crane Company.—Hancock inspirators; main steam valves; boiler check valves; hose strainers; blow-off valves; globe and angle valves and locomotive trimmings; Consolidated safety valves; Ashcroft steam, vacuum, pressure and recording gauges and Tabor indicators; one F. E. Reed Company 24-inch special heavy pattern motor driven engine lathe; one Foote-Burt 24-inch high duty belt driven shaper; one Foote-Burt 36-inch swing high duty belt driven drill; one Cincinnati 26-inch x 8-ft. single head motor driven traverse shaper; one Gridley 4¼-inch single spindle motor driven turret lathe; one Gridley 1¼-inch four-spindle turret lathe; one Hendey No. 4 motor driven milling machine; one Hendey 16-inch geared head engine lathe; one Hendey motor driven shaper; one Dreses 5-foot motor driven full universal radial drill with tapping attachment; one National 1½-inch wedge grip heading and forging machine; one National motor driven double head bolt cutter; one National die sharpener; one Elmore high duty ball bearing single spindle sensitive drill, motor driven. Represented by James B. Brady, W. O. Jacquette, J. N. Derby, C. E. Randall, R. A. Bole, M. A. Sherritt, P. M. Brotherhood and C. L. Lyle. Space 114.
- McConway & Torley Company, The, Pittsburg, Pa.—Pitt freight coupler; Janney "X" freight coupler; Pitt passenger coupler; a new swivel head coupler with McConway centering device as being applied to new steel passenger coaches of the Pennsylvania railroad; Pitt tender coupler; Pitt pilot coupler; Buhoup steel truck side frame; Buhoup 3-stem coupler, and the McConway steel wheel. Represented by Stephen C. Mason, E. M. Grove, H. C. Buhoup and I. H. Milliken. Space 527.
- McCord & Company, Chicago, Ill.—The following Journal boxes: cast steel passenger; vanadium grey iron passenger; malleable iron steel inserted passenger; pinless lid; malleable iron with outside metal dust guard. Locomotive force

- feed lubricator; lubricating driving box; national equalizing wedge; McCord draft gear; and McCord spring dampener; McKim gasket. Models of universal windows for wood and steel cars; universal weatherstripping; gravity wedging sash locks; universal wedging sash locks; universal extension sash locks; one special design metal sash; universal deck sash ratchets. Represented by D. W. McCord, J. A. Lamon, Morrill Dunn, R. L. McIntosh, B. McClellan, W. G. Wilcoxson, F. S. Nickerson, D. J. McOske and W. J. Schlacks. Space 494.
- McGraw Publishing Company, New York, N. Y.—Electric Railway Journal and Engineering books. Space 7.
- Midvale Steel Company, The, Philadelphia, Pa.—Rolled steel wheels. Represented by W. P. Barba, E. Harrah, T. W. Illingsworth, S. Griffith, C. Tietze, James Thompson, M. W. Welsh and L. Wells. Space 9.
- Milburn Company, The, Alexander, Baltimore, Md.—Railroad construction light, 5,000 candle power; lights for wreckers, cranes, steam shovels, etc.; fire lights; miners' lights; construction lights up to 10,000 candle power. Represented by A. F. Jenkins, Charles Pollard and I. E. Stansbury. Space 402.
- Modoc Soap Company, Philadelphia, Pa.—Perfectol car and locomotive cleaner. Space 434.
- Molleson Company, Geo. E., New York, N. Y.—Tyler charcoal iron boiler tubes; everlasting blow-off valve; spiral stay-bolt. Represented by Geo. E. Molleson and Huntly H. Gilbert. Space 439.
- Moran Flexible Steam Joint Company, Louisville, Ky.—Flexible joints for steam, air, gas and liquid steam coupler for use between engine and dynamo car. Space 155.
- Nachod Signal Company, Philadelphia, Pa.—Signal apparatus. Space 234.
- Nathan Manufacturing Company, New York, N. Y.—Injectors; lubricators; boiler checks; fire extinguishers; boiler washers and testers; Klinger water gauges; oil cups; feed water strainers; ejectors; water gauges; whistlers; air brake lubricators, and miscellaneous appliances for use on locomotives. Represented by Sanford Keeler, J. S. Seeley, J. C. Currie, Chas. R. Kearns, James E. Minor, M. Stettinheimer, Edward S. Toothe and Alfred Nathan. Space 379.
- National-Acme Manufacturing Company, The, Cleveland, Ohio.—Automatic screw machine—"Acme-Multiple-Spindle." Represented by W. S. Chase, E. C. Woolgar, L. M. Waite and J. F. Judd. Space 111.
- National Lock Washer Company, The, Newark, N. J.—Sash locks; curtain fixtures, sash balances; spring parallel sash guides and lock washers; chain attaching device for sash balances. Represented by: William C. Dodd, Frank B. Archibald, John B. Seymour and Daniel Hoyt. Space 28.
- National Malleable Castings Company, The, Cleveland, O.—Sharon, Tower, Climax and Latrobe couplers. Represented by S. L. Smith, W. E. Coffin, F. R. Angell, J. V. Davison, R. T. Hatch, J. H. Jaschka, J. H. Merrell, Jr., G. V. Martin, H. D. Hammond, L. S. Wright, C. A. Bieder, K. R. Johnston, B. Nields, Jr., R. H. Pilson, E. O. Warner and J. A. Slater. Space 522.
- National Railway Devices Company, Chicago, Ill.—Uncoupling apparatus which includes positive release of coupler in case of "pull out" (Duplex uncoupler and automatic release); fire door and door operator. Represented by Jay G. Robinson, J. W. Luttrell and J. A. Good. Space 433.
- Nelson Valve Company, Philadelphia, Pa.—Valves in bronze, iron and steel; a complete unit of testing apparatus in actual operation; twelve inch electrically operated valve with complete control will be shown running; a superheated steam steel gate valve, absolutely tight after thorough trials for two years. Represented by Carlisle Mason, M. D. Baldy, W. J. Spencer, R. E. Thomas and H. C. Baynard. Space 141.
- Newhall Engineering Company, George M., Philadelphia, Pa.—Photographs of wrecking and locomotive cranes; pillar and transfer cranes; pile drivers; transfer tables, rail saws, etc., as manufactured by the Industrial Works, Bay City, Mich.; "NB" hose connections for air brake, signal and steam hose; Pahlow pneumatic hose appliances, and Vance steam trap. Represented by David Newhall, Morton L. Newhall, William L. Brown and Glenn B. Harris. Space 374.
- New York Air Brake Company, The, New York, N. Y.—Automatic control equipment for locomotive and tender; automatic control equipment for passenger cars; type K triple valve for freight service; type J triple valve for passenger service; self-locking angle cock handle; combined brake pipe strainer and cut-out cock; improved hose coupling; Forsyth automatic connector and New York producer gas engine plant. Represented by H. F. Bickel, N. A. Campbell, J. E. Forsyth, W. T. Henry, G. O. Hammond, J. A. Hicks, G. A. Kleifges, C. P. Lovell, C. E. Leach, Geo. Marlow and F. M. Whyte. Space 330.
- Nichols & Brother, G. P., Chicago, Ill.—Electric turn table tractor. Represented by Geo. P. Nichols and Henry Fries. Space 406.
- Nickelized Casting Company, Pittsburgh, Pa.—One 36 inch and one 33-inch worn nickelized chilled car wheels; two 33-inch nickelized chilled car wheels cast from open hearth furnace and double annealed. Represented by Robert C. Totten, George L. Fowler. Space 419.
- Niles-Bement-Pond Company, New York.—This exhibit includes also an exhibit of the Pratt & Whitney Company.—A 20-inch La Blonde engine lathe with all-gear head; new type cone head for same; La Blonde universal milling machine; pneumatic tool clamp for steel tire lathe; Pratt & Whitney small tools, gauges, etc. Represented by J. K. Cullen, J. T. McMurray, D. J. Normoyle, G. F. Mills, E. L. Leeds, N. C. Walpole, E. S. Cullen, D. H. Teas and Frank Miles. Space 149.
- North Brothers Manufacturing Company, Philadelphia, Pa.—"Yankee" tools; ratchet screw drivers; spiral screw drivers; automatic push drills; hand drills. Represented by F. A. Mutchmore. Space 152.
- Norton Company, Worcester, Mass.—Large show case containing an assortment of alundum grinding wheels and India oil stones; alundum in grains. Represented by Geo. C. Montague, Geo. Stone, H. N. Cudworth and Hans Wickstrom. Space 150.
- Norton, Incorporated, A. O., Boston, Mass.—High speed ball-bearing lifting jacks. Represented by H. A. Norton, J. O. St. Pierre, R. D. Bates, H. J. Wilson and R. L. Skidmore. Space 489.
- Official Railway Guide, New York, N. Y.—Represented by Geo. E. Armstrong and E. Bjerregaard. Space 34.
- Okonite Company, The, New York, N. Y.—Specimens of all kinds of cables and wires for electric light, power, transmission, telephone, telegraph, etc. Also specimens of crude fine Para rubber. Represented by Lewis G. Martin, John Langan and F. J. White, assisted by J. M. Lorenz, of Central Electric Co., Chicago, Ill. Space 335.
- Pantasote Company, New York, N. Y.—Pantasote curtains and materials; Pantasote upholstery fabrics; Agosote millboards for headlinings, interior trim, etc. Represented by John M. High, W. A. Lake and W. S. Barrows. Space 302.
- Parker Car Heating Company, Detroit, Mich.—Parker anti-freezing and hot water system with automatic discharge; complete systems for all classes of equipment. Represented by Thomas Parker, J. M. McEvoy and C. S. Parker, Jr. Space 218.
- Parkesburg Iron Company, Parkesburg, Pa.—Photographs of mills showing process of manufacture; also samples of charcoal iron boiler tubes. Represented by H. A. Beale, Jr., C. L. Humpton, J. H. Smythe, W. H. S. Bateman, George Thomas, 3rd, H. C. Hunter, J. A. Kinkead and L. P. Mercer. Space 388.
- Pay Within Car Company, Chicago, Ill.—Center door of the Interboro subway cars of New York. Represented by F. H. Lincoln and H. Hellyer. Space 236.
- Pennsylvania Flexible Metallic Tubing Company, Philadelphia, Pa.—Flexible metallic hose for steam connection between cars; blower and washout hose. Represented by J. M. Odenheimer. Space 210.
- Pilliod Brothers, Toledo, Ohio.—Quarter size model of the Pilliod locomotive valve gear in operation. Represented by C. J. Pilliod and H. J. Pilliod. Space 222.
- Pilliod Company, The, Swanton, Ohio.—Baker-Pilliod locomotive valve gear. Radial locomotive ash pans. Represented by R. H. Weatherly, R. F. Darby, F. E. Pilliod, A. Pilliod and J. W. Albeck. Space 400.
- Pittsburgh Equipment Company, Pittsburgh, Pa.—Cast steel double web truck bolster; cast steel truck side frame; interlocking cast steel journal boxes; cast steel interlocking spring plank; cast steel draft casting; aluminum model of

- center plate and side bearing. Represented by H. V. Seth, John Allison and E. R. Williams. Space 529.
- Pocket List of Railroad Officials, New York, N. Y.—Pocket list of railroad officials. Represented by Chas. L. Dinsmore and Harold A. Brown. Space 7.
- Pressed Steel Car Company, Pittsburgh, Pa.—Photographs of various products in booth. On Philadelphia & Reading track, Mississippi Avenue, an ore car. Represented by O. C. Gayley, C. E. Postlethwaite, J. H. Mitchell, L. O. Cameron, G. T. Merwin, J. S. Turner, Victor von Schlegel, W. H. Wilkinson, M. S. Simpson, J. G. Bower, H. S. Hammond, Geo. W. Restine and Charles A. Lindstrom. Space 509.
- Pugh, Job T., Philadelphia, Pa.—Augers, bits and chisels. Represented by Job T. Pugh and Geo. A. Phillips. Space 385.
- Railway Age Gazette, New York, N. Y.—Represented by William H. Boardman, Edward A. Simmons, Henry Lee, Frank S. Dinsmore, Lucius B. Sherman, John N. Reynolds, Cecil R. Mills, Samuel O. Dunn, Bradford Boardman, Roy V. Wright, William Forsyth, George L. Fowler, William E. Hooper, Francis E. Lister, Francis W. Lane, William D. Horton, L. B. Mackenzie, Fred W. Bender, George A. McKeague, T. E. Crossman, A. B. Weaver and J. C. Marriott. Space 1.
- Railway and Engineering Review, Chicago, Ill.—Represented by Willard A. Smith, A. E. Hooven, P. G. Stevens, John M. Lammedee and G. E. Ryder. Space 12.
- Railway List Company, The, Chicago, Ill.—Monthly Official Railway List and Railway Master Mechanic. Represented by W. E. Magraw, C. S. Myers, L. F. Wilson and C. C. Zimmerman. Space 35.
- Railways Materials Company, The, Chicago, Ill.—Reception booth. Represented by George L. Bourne, T. B. Cram, C. M. Mendenhall, J. Schurch and Geo. Hoeffe. Space 479.
- Rapp Company, John W., New York, N. Y.—Steel car doors and mouldings. Represented by C. A. Leonardi. Space 20.
- Restein Company, Clement, Philadelphia, Pa.—Fibrous packing for steam, water, ammonia, hydraulics, oil, gases, acids, etc. Represented by Clement Restein, William J. Cromie and Norman B. Miller. Space 16.
- Revolute Machine Company, New York, N. Y.—Continuous electric blue printing machines. Represented by J. V. McAdam and C. J. Everett. Space 328.
- Rockwell Furnace Company, New York, N. Y.—Furnaces for railroad shops. Space 4.
- Royersford Foundry & Machine Company, Inc., Royersford, Pa.—Punch and shearing machines and Sells roller bearings. Represented by Y. C. Freed, A. Loomis and John D. Sells. Space 115.
- Safety Car Heating & Lighting Company, New York, N. Y.—Latest type single mantle lamps; axle-driven dynamo electric lighting equipment; lighting fixtures; demonstration of vapor lighting equipment for branch line service; and the Safety heating system for passenger trains; revolving gas mantle buoy. Represented by R. M. Dixon, J. A. Dixon, L. R. Pomeroy, R. C. Schaal, G. E. Hulse, J. S. Henry, Wm. St. John, D. W. Pye, J. M. Town, R. C. Moore, C. B. Adams and W. L. Garland. Space, stairway platform.
- Schoen-Jackson Company, Media, Pa.—Flexible metallic steam hose; water hose; air hose; air brake hose, and flexible metallic hose for every purpose wherein rubber hose is now used. Represented by Charles T. Schoon, M. R. Jackson, W. R. Wood, R. B. Ross and E. C. Pollard. Space 404.
- Scullin-Gallagher Iron & Steel Company, St. Louis, Mo.—Cast steel bolsters and truck side frames. Represented by Thomas M. Gallagher, Frank L. Norton, George L. L. Davis, Frank W. Graves, S. M. Dolan, Ed. M. Fitzgerald, S. R. Fuller, Jr., L. C. Ullrich, P. J. Howard, H. H. Waldron, O. G. Mueller and T. W. Aishton. Space 135.
- Scully Steel & Iron Company, Chicago, Ill.—Space 437.
- Sellers & Company, Inc., William, Philadelphia, Pa.—Locomotive injectors and accessories; model of the original Giffard injector; ball and socket hanger; hanger boxes and couplings; set of three drivers for our extra high power 42-inch car wheel lathe, mounted upon a temporary wooden face plate; a turret rest of this lathe, and a pair of wheels turned by the lathe; a turret rest of our extra high power locomotive driving wheel lathe. Represented by Strickland L. Kneass, John D. McClintock, Clinton B. Conger, Charles T. Wilson, Edward L. Hölljes and Frederick W. Ancona. Space 506.
- Sherwin-Williams Company, Cleveland, Ohio.—Sherwin-Williams passenger coach systems. Represented by E. M. Williams, W. B. Albright, E. M. Richardson, Thomas Madill and F. A. Elmquist. Space 33.
- Simplex Railway Appliance Company, New York, N. Y.—In booth with American Steel Foundries. Space 157.
- Smith Premier Typewriter Company, Syracuse, N. Y.—Billing and bookkeeping machines; machines for way billing and railway expense billing; new visible typewriter. Represented by H. J. Seddon, A. N. Ashmore and a staff of operators. Space 2.
- Spencer Turbine Cleaner Company, Hartford, Conn.—A 5-horsepower vertical direct driven turbine cleaner; new pressed steel vacuum cleaning tools. Represented by E. W. Muzzy, Guy Noble and K. B. Smith. Space 408.
- Sprague Electric Company, New York, N. Y.—Flexible steel armored air brake hose; flexible steel armored signal hose; flexible steel armored steam, pneumatic, hydraulic and water hose and fittings for shop use; electric conduit supplies; electric fans. Represented by A. C. Bakewell, D. C. Durland, H. H. Hornsby and Henry W. Uhl. Space 322.
- Standard Car Truck Company, Chicago, Ill.—Barber standard lateral motion truck; Barber double action truck and Barber roller bearing center plates. Represented by J. C. Barber, J. T. Milner, L. W. Barber, F. L. Barber and E. W. Web. Space 123.
- Standard Coupler Company, New York, N. Y.—Standard steel platforms; Sessions-Standard friction draft gears; Standard slack adjusters. Represented by George A. Post, E. H. Walker, A. P. Dennis, R. D. Gallagher, Jr., and C. D. Jenks. Space 339.
- Standard Steel Car Company, Pittsburgh, Pa.—Space 466.
- Standard Steel Works Company, Philadelphia, Pa.—A reception booth. Represented by H. DeH. Bright, Charles Riddell, George F. Jones, E. B. Halsey, C. H. Peterson, H. W. Sheldon, F. W. Weston, E. Sidney Lewis, W. H. Pugh, Jr., and H. G. Pearce. Space 484.
- Stoeber Foundry & Mfg. Co., The, Myerstown, Pa.—One number 2 automatic pipe bending machine, motor driven, capacity 1 in. to 2 in.; one number 2 pipe threading and cutting off machine, motor driven, capacity ¼ in. to 2 in. Represented by W. E. Farrell, Ed. R. Euston and J. F. Morris. Space 121.
- Storrs Mica Company, Owego, N. Y.—Samples of mica headlight chimneys for oil and acetylene headlights; mica chimneys for use on caboose, cab, station and switch lamps; mica lantern globes; collection of samples of mica from various parts of the world. Represented by A. P. Storrs and Charles P. Storrs. Space 19.
- Strong, Carlisle & Hammond Company, Cleveland, Ohio.—Randall graphite sheet lubricator; Strong's steam specialties, including steam and vacuum traps, pressure reducing valves, steam separators, and the Handy wrench. Represented by B. E. Carpenter and Homer Whepley.
- Symington Company, The T. H.—Baltimore, Md.—Farlow draft gear; journal boxes; flexible dust guards; roller side bearings. Represented by T. H. Symington, W. A. Garrett, J. F. Symington, C. J. Symington, E. H. Symington, Donald Symington, W. W. Rosser, T. C. DeRosset, D. F. Mallory, I. O. Wright, B. S. Johnson, A. H. Weston and S. L. Kamps. Space 524.
- Talmage Manufacturing Company, Cleveland, Ohio.—Talmage system ash pan cleaner. Represented by J. G. Talmage, E. H. Janes, J. F. Walker and C. F. Kahler. Space 313.
- Taylor Manufacturing Company, James L., Bloomfield, N. J.—Car, boilermakers' patternmakers' and machinist clamps. Represented by James L. Taylor and Edward C. Blake. Space 18.
- Templeton, Kenly & Co., Ltd., Chicago, Ill.—Simplex car and track jacks; simplex geared jacks, and the component parts of the simplex jacks. Represented by Alfred E. Barron, J. H. Hummel and F. A. Barbey. Space 487.

Tindel-Morris Company, Eddystone, Pa.—Paragon cold saw machine; standard and structural type "Tindel" inserted tooth cold saws; saw grinder. Represented by Lincoln W. Gruber and David G. Nixon. Space 306.

Titan Steel Casting Company (formerly Benjamin Atha & Company), Newark, N. J.—Body and truck bolsters; tank car saddle; manganese steel gears and pinions. Represented by Louis A. Shepard, G. T. Paraschos and Chas. W. Owston, Jr. Space 368.

Toledo Pipe Threading Machine Company, The, Toledo, Ohio.—Hand operated threading tools, threading 12-inch, 8-inch and 4-inch standard steel pipe; several smaller threading tools, vises, vise-mounts and pipe cutters. Represented by W. C. Longenecker, S. S. Thornberry and Clarence A. Popp. Space 44.

Tyler Tube & Pipe Company, Washington, Pa.—Space 439.

Underwood & Co., H. B., Philadelphia, Pa.—Portable cylinder boring bar; portable crank-pin returning machine; new portable crank-pin rivet head facer; portable rotary boiler tube cleaner; locomotive pedestal facing machine. Represented by A. D. Pedrick and D. W. Pedrick, 2d. Space 310.

Union Draft Gear Company, Chicago, Ill.—Cardwell friction draft gear; Cardwell rocker side bearings. Represented by J. R. Cardwell, L. T. Canfield, J. D. Ristine, W. G. Krauser and J. E. Tarleton. Space 476.

Union Fibre Company, Winona, Minn.—Linofelt, for the insulation of refrigerator cars; fireproof lith; rigid linofelt and steel car linofelt, for the insulation of steel coaches; waterproof lith and flax lith board, for the insulation of ice houses. Represented by F. J. Bingham, S. E. McPartlin, H. W. Leeds and J. H. Bracken. Space 448.

Union Manufacturing Company, New Britain, Conn.—Lathe; planer; drill; boring mill; car wheel and valve chucks. Represented by M. L. Bailey, A. F. Corbin, E. I. Stevens, H. H. Wheeler, J. W. Carlton, W. F. Curtis and C. S. Newman. Space 145.

Union Spring & Mfg. Company, Pittsburg, Pa.—Elliptic and coil springs; pressed steel spring plates and journal box lids; all-steel Kensington journal boxes; steel castings. Represented by A. M. McCrea, L. G. Woods, C. S. Foller, A. Pancoast, H. B. Darlington, A. C. Woods, T. B. Arnold, H. F. Ayers, E. W. Snowdon and W. F. La Bonta. Space 430.

U. S. Metal & Manufacturing Company, New York, N. Y.—Feasible drop brake staff; diamond tapered steel pole; Owen-Cochran pressed steel journal box; Empire pressed steel bolster; Detroit car door; Barol wood preservative; St. Louis surfacer paint panels; Columbia lock nuts; M. C. B. repair and defect card box; New York Central box car equipped with Hutchins all-steel—steel carline roof on exhibition track. Represented by B. A. Hegeman, Jr., Charles C. Castle, Frederick C. Dunham, Edward D. Hillman, Arthur Masters and Harold A. Hegeman. Space 337.

United States Metallic Packing Company, The, Philadelphia, Pa.—United States multiangular metallic packing and King type metallic packing for locomotive piston rods and valve stems. Collmar pneumatic locomotive bell ringers; valve stem clamps; braided cotton swabs; "Indestructible" oil cups. Represented by Morris B. Brewster, C. B. Ford, C. L. Mellor, J. S. Mace, H. M. Wey, and E. Curtiss. Space 427.

Vanadium Metals Company, Pittsburgh, Pa.—Vanadium metals, comprising vanadium bronze shown in castings of bells, brasses, cold drawn rods and sheets; Vanadium non-corrosive silver metal shown in ornamental fittings; Vanadium anti-friction metal. Represented by J. Rogers Flannery. Space 440.

Von Kokeritz & Company, R. G., New York, N. Y.—Durable high-pressure sheet packing and gaskets; heather high-pressure piston packing; hydra hydraulic packing; cosmos paint; glardon clips. Represented by R. G. Von Kokeritz, N. P. Hill and J. A. Carson. Space 214.

Walker & Bennett Manufacturing Company, New York, N. Y.—Simplified car seats. Represented by John Havron, K. D. Hequembourg and S. A. Walker. Space 36.

Walworth Manufacturing Company, Boston, Mass.—Space 232.

Ward Equipment Company, New York, N. Y.—Car heating apparatus. Complete locomotive steam heat equipment, including reducing valves, starting valves, steam heat gauges and steam couplers with locks. Complete equipments for heating all classes of cars, both steel and wood. Direct steam systems. Ward's ideal heating system, end train line

valves, automatic steam traps, steam couplers and special fittings. Ward's car ventilator and Ward's yard plug and car receptacle for charging storage batteries on electrically lighted cars. Represented by John E. Ward, Alfred W. Kiddle, George B. Culver and Richard Voges. Space 462.

Watrous Company, The, (not inc.) Chicago, Ill.—Car water closets; wash stands; and other sanitary specialties. Represented by E. G. Watrous and S. D. Barnett. Space 316.

Watson Insulated Wire Company, Chicago, Ill.—With Kerite Insulated Wire and Cable Company. Represented by J. V. Watson, B. L. Winchell, Jr. and R. A. Patterson. Space 413.

Watson-Stillman Company, The, New York, N. Y.—Shop jacks; wrecking jack; journal box jack; outside and inside pump and independent pump type jacks; telescopic motor lift jack; portable hydraulic beam punch; hydraulic T rail bender; 125 ton crank pin press; 200 ton motor-driven hydro-pneumatic wheel press; 30 ton portable axle bearing press; portable shaft straightener; 4 twin-volute turbine pumps in operation; working model Chambers locomotive throttle valve. Represented by Geo. H. Gillon, Frank Clark, Edwin Stillman, H. A. Prindle, Austin Stillman, Chas. Howells, J. O. Meeks, Richard Baker and A. Eugene Michel. Space 401.

Waugh Draft Gear Company, Chicago, Ill.—Full sized draft gear, 600,000 pounds capacity, as applied to steel under-frame cars; two full sized cased gears, 250,000 and 450,000 pounds capacity. Represented by Anson L. Bolte and Samuel T. Rowley. Space A.

Welsoach Company, Gloucester, N. J.—Incandescent gas lamps for railway station, yard and shop lighting; incandescent gas mantles. Represented by Chas. W. Wardell. Space 11.

West Disinfecting Company, Inc., New York, N. Y.—Soap dispensers; disinfectants; disinfecting appliances for toilet rooms; fumigating apparatus. Represented by E. Taussig, Geo. L. Lord and Chas. F. Pierce. Space 426.

Western Railway Equipment Company, St. Louis, Mo.—Acme brake slack adjusters; Western sill and Carline pockets; Western brake jaws; Republic draft gear; Acme pipe clamps; Linstrom eccentrics; Linstrom syphon pipes; Western flush car doors; interchangeable car doors; Western angle cock holders; Hoerr car doors; St. Louis flush car doors; Security dust guard; Downing card holders; Economy slack adjusters; Western bell ringer; car door fastenings; fish hook tie plates; brake pins and tie dating nails. Represented by Louis A. Hoerr and S. H. Campbell. Space 372.

Westinghouse Air-Brake Company, Pittsburgh, Pa.—Seven-car passenger train rack, operative, equipped with the P. C. equipment; in connection with this rack is an electric sign showing braking power and deceleration curves for the purpose of comparing the P. C. equipment with the high-speed equipment in the stopping of modern passenger trains; empty and load brake equipment as applied to cars operative; centrifugal dirt collector and suction demonstration. Represented by A. L. Humphrey, J. R. Ellicott, E. L. Adreon, E. A. Craig, W. V. Turner, C. F. Street, H. F. Woernley, C. C. Farmer, F. V. Green, W. S. Bartholomew, C. J. Olmstead, S. J. Kidder and P. H. Donovan. Spaces 27 and 136.

Westinghouse Automatic Air & Steam Coupler Company, St. Louis, Mo.—Sample of their automatic air and steam coupler. Space 27.

Westinghouse Bureau of Publicity, Pittsburgh, Pa.—Represented by J. C. McQuiston, W. Barnes, Jr. Space 27 and 136.

Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa.—Motors, controllers, transformers, switchboards and arc lamps. Represented by Chas. Robins, R. F. Moon, H. C. Mack and J. J. Dorney. Spaces Nos. 27 and 136.

Westinghouse Lamp Company, Bloomfield, N. J.—Incandescent lamps for all classes of railway service; tungsten and carbon filaments, two watts to five hundred watts. Represented by B. F. Fisher, Jr. Spaces 27 and 136.

Westinghouse Machine Company, Pittsburgh, Pa.—Le Blanc condenser and Le Blanc vacuum pump, turbine driven. Represented by E. H. Sniffen, E. Yawger, L. L. Brinsmade, H. Van Barcolom, C. H. Paine and H. P. Childs. Spaces Nos. 27 and 136.

Wheel Truing Brake Shoe Company, Detroit, Mich.—Abrasive brake shoes. Represented by J. M. Griffin. Space 423.

Whipple Supply Company, New York, N. Y.—Reception booth. Represented by A. L. Whipple. Space 468.

Williams Company, J. H., Brooklyn, N. Y.—Drop forgings. Space 42.

Wilson Remover Company, New York, N. Y.—Varnish remover and instruments. Represented by I. McNeal Wilson. Space D 3.

Wood, Guilford S., Chicago, Ill.—Wood's flexible nipple end hose protector; monogram bracket and samples of rubber tiling. Represented by Guilford S. Wood and D. F. Jennings. Space 216.

Wright Wrench Manufacturing Company, The, Canton, Ohio.—Wright monkey and pipe wrenches. Represented by Geo. H. Kitzoe. Space 23.

Yale & Towne Manufacturing Company, New York, N. Y.—Electric hoists, triplex chain blocks, I-beam trolleys, electric triplex hoists, padlocks, car door checks, night latches, builders' hardware. Represented by C. W. Beaver, C. H. Van Winkle, H. C. Spaulding, H. R. Butler, R. T. Hodgkins and W. C. Allen. Space 154.

M. C. B. REGISTRATION.

Anderson, Geo. T., Supt., New York Despatch Refr. Line.
 Arp, W. C., S. M. P., Vandalia R. R.
 Brazier, F. W., Supt. R. S., N. Y. C. & H. R. R. R.
 Burnett, R. W., M. C. B., Can. Pac. Ry.
 Burton, T. L., Gen. Insp., P. & R. R. R., C. R. R. of N. J.
 Bussing, G. H., S. M. P. & R. S., Evansville & Terre Haute R. R.
 Caton, S. W., G. C. I., Western Maryland R. R.
 Chamberlain, E., Chairman Frt. Car Pool Lines, N. Y. C.
 Chamberlain, J. T., Past Pres., M. C. B. Ass'n.
 Chenoweth, E. G., M. E., Erie R. R.
 Clark, F. H., G. S. M. P., C. B. & Q. Ry.
 Clark, M. Rae, G. M. M., Louisville & Nashville R. R.
 Cleaver, F. C., S. M. P., Rutland R. R.
 Coleman, Jas., S. C. D., Grand Trunk Ry.
 Conally, J. J., S. M. P., D. S. S. & A. R. R.
 Cornith, A. B., A. S. M. P., A. & C. L. R. R.
 Curtis, Theo. H., S. M., L. & N. R. R.
 Dawson, L. L., S. M. P., Ft. Worth & Denver R. R.
 DeVoy, J. F., M. E., C. M. & St. P. Ry.
 Dickerson, S. K., Asst. S. M. P., L. S. & M. S. Ry.
 Dooley, W. H., M. M., A. G. S. R. R.
 Dow, Geo. N., G. M. I., L. S. & M. S. Ry.
 Durburow, R. N., S. M. P., Penna. R. R., East. Div.
 Eberle, Wm. F., Gen. Foreman, Penna. R. R.
 Everett, Ira, Gen. For., L. V. R. R.
 Fitzgerald, D. E., Asst. Gen. S. M. P., Frisco System.
 Forsythe, Wm., Railroad Age Gazette.
 Fowler, W. E.
 Fuller, C. E., S. M. P., Union Pacific R. R.
 Goodrich, G. P., M. M., Ft. Smith & Western R. R.
 Gossett, C. E., M. M., Iowa Central R. R.
 Gould, Jos. E., S. M. P., N. & So. Ry.
 Hall, W. B., Mather Stock Car Co.
 Hathaway, J. W., Genl. Car Foreman, Frisco System.
 Hennessey, J. J., M. C. B., C. M. & St. P. Ry.
 Hill, Jno., M. M., Minn. & St. Louis.
 Hodgson, Jno., M. C. B., Grand Trunk Ry.
 Hogarth, Wm., Supt. Car Dept. Cudahy Refg. Line.
 Kalbaugh, I. N., S. M. P., Coal & Coke Ry.
 Keegan, J. E., S. M. P., Grand Rapids & Indiana Ry.
 Kellogg, W. L., S. M. P., C. H. & D.
 Kinter, D. H., G. F. C. D., Monongahela.
 LaMar, A., Gen. Car Insp., N. W. System.
 Lane, F. W., The Times.
 La Rue, Henry, M. C. B., C. R. I. & P. Ry.
 Lentz, Jno. S., M. C. B., Lehigh Valley R. R.
 Libby, J. E., Swift Ref. Trans. Co.
 Luscombe, J. T., M. M. T. & O. C. Ry.
 Maher, Peter, S. M. P., C. & A. Ry. & T., St. L. & W.
 Manchester, A. E., S. M. P., C. M. & St. P. Ry.
 Manning, Jas. H., S. M. P., D. & H. Co.
 Martin, P. A., Supt. Equip., National Car Lines.
 Mav, H. C., M. M., Lville. & Nashville R. R.
 McFeatters, F. R., Supt., Union R. R. Co.
 McWood, Wm., Past Pres. M. C. B. Ass'n.
 McKenna, R. F., Past Pres. M. C. B. Ass'n.
 McRae, J. A., M. E., Mich. Cent. R. R.
 O'Donnell, T. J., Arbitrator, Niagara Frontier Inspection Ass'n.
 Passmore, H. E., M. M., Toledo & Ohio Central Ry.
 Peterson, A. F., M. C. B., Cold Blast Trans. Co.
 Phillips, C., M. M., New Orleans & N. E. R. R.
 Prescott, C. H., M. M., Spokane International R. R.
 Ramsdell, T. M., M. C. B., C. & O. Ry.
 Rockfellow, W. E., Gen. Car Foreman, N. Y. C. & H. R. R.
 Ross, D. C., M. C. B., M. C. R. R.
 Scheffer, F. H., S. M. P., N. Y. C. & St. L. Ry.
 Seddon, C. W., S. M. P. & C., Duluth, Messabe & No. Ry.

Seley, C. A., M. E., C. R. I. & P. Ry.
 Selloy, Samuel H., G. F. C. D., B. & A. R. R.
 Smith, R. D., A. S. M. P., B. & A.
 Smith, Willard A., Editor, The Railway Review.
 Staley, H. F., M. M., Cairo, Clinchfield & Ohio Ry.
 Stark, J. L., G. I. C. D., Hocking Valley.
 Stiffey, S. S., S. M. P. T. & O. C. R. R., Zanesville & Western.
 Swanson, C. N., Genl. Car Insp., A. T. & S. F.
 Taylor, J. W., Secy. M. C. B. Ass'n.
 Thomas, J. J. Jr., S. M. P., Mobile & Ohio R. R.
 Thompson, W. O., M. C. B., N. Y. C. & H. R. R. Co.
 Trimyer, H. L., M. C. B., Seaboard Air Line Ry.
 Underwood, Sidney S., Chief Draughtsman, Grand Trunk Ry.
 Wahlen, John, M. M., Montpelier & Wells River R. R.
 Wallis, J. T., S. M. P., Northern Central Ry.
 Westervelt, Jos., M. C. B., N. Y. C. & H. R. R. R.
 Wildin, G. W., Mech. Supt., N. Y. N. H. & H. R. R.
 Wright, R. V.
 Young, C. B., M. E., Chicago, Bur. & Quincy R. R. Co.

M. C. B. GUESTS.

Beltzhoover, G. G., S. Agt., Pass. Dept., Penna.
 Boyer, C. E., A. G. Car Insp., P. R. R.
 Brown, David, Asst. Supt. M. P., D. L. & W.
 Buchanan, T. P., T. F. A., M. K. & T.
 Burns, Frank, M. M., Frisco System.
 Clark, Harold, Care G. S. M. P., C. B. & Q. Ry.
 Colkins, A. E., Chief Clerk to Supt. Rolling Stock, N. Y. C. & H. R. R. R.
 Cornell, W. S., Pass. Dept., P. R. R.
 Croxter, C. A., Pass. Dept., P. R. R.
 Croxton, D. T., President, Cuyahoga Valley Ry.
 Donahue, D., M. C. B., A. G. S. R. R.
 Egbert, Elisha, Eng., C. of N. J.
 Feighan, W. C., Watch Ins., P. & R.
 Fuller, Harry C., U. P.
 Gardner, J. T.
 Hatz, G. J., Shop Supt., U. P.
 Hatz, Herbert.
 Hyndman, Frank T., S. F. Bowser & Co.
 Jackson, S., Secy., S. M. P., Penna. R. R.
 Jett, E. E., M. C. B., Morris & Co.
 Keegan, J. E. Jr., Chf. Draftsman, G. R. & I. Ry.
 Keown, Robert, Jr., P. R. R.
 Kimberley, H. D.
 Kinney, M. A., M. M., Hocking Valley.
 Leach, Henry L.
 Maize, W. L., Pin. Agt., Phila. Rapid Transit Co.
 Mechin, Ernest F., U. S. Patent Examiner, U. S. Patent Office, Washington.
 Murphy, James S., P. R. R.
 McIlwain, J. D., Treas. Rwy. Club.
 O'Brien, Jno. J., Sup. Car Dep., Terminal R. R. Ass'n.
 Ogilvie, James, Insp. of Ry. Equip. & Safety Ap., Ry. Comm. of Canada.
 Phillips, D. C.
 Portner, W. H., G. C. I., C. N. O. & T. P. Ry.
 Prescott, Dal. C.
 Quigley, Joseph, S. M. P., Q. & C.
 Ramsdell, T. M., Jr.
 Russell, T. M., Gen. Car Inspector, C. H. D. R. R.
 Schmidt, Edward C., Assoc. Professor Railway Engineering University of Illinois.
 Summerskill, T. A.
 Taylor, Clifford, Sec'y to M. C. B., C. & O.
 Ten Eyck, W. E., A. C. R. R.
 Weighe, John, Foreman Car Inspectors, West Jersey & Sea Shore Ry.
 Wheeler, C. H., Sup. Air Brakes, L. S. & M. S.

VALUABLE BOOKS FOR MECHANICS.

Since 1891 the publishers of the International Library of Technology have been engaged in preparing the instruction papers of the International Correspondence Schools, Scranton, Pa., of which they are the owners. These instruction papers, prepared and revised with great care, embody those applications of science to industry that constitute the best American engineering, shop, field, mine and laboratory methods. The difficulties of obtaining this material and the expense of preparing it for publication have been great. The best technical experts have been employed, constituting an unequalled corps of practical, scientific writers. The work was illustrated by a special staff of artists and draftsmen.

After an expenditure said to be over \$1,500,000, the publishers offer this practical technical library for sale. It comprises the advanced and technical papers of the International Correspondence Schools, carefully arranged and indexed for ready reference. Ninety-nine volumes are now ready, which cover the leading trades, professions and industrial sciences, and include some 50,000 pages and 25,000 special cuts, drawn in outline, section and perspective, and printed in black and white and in colors.

That I. C. S. textbooks differ in many respects from regular textbooks is proved by their popularity and the enrollment of over a million and a quarter students desiring to use them. The regular school and college textbook deals more or less exhaustively with a subject or subjects, and covers practically the same ground as any one of half a dozen or more other textbooks on the same subject. The aim of the author of such a textbook is to produce a work that may be used by all who wish information that would naturally come under the heading under which the book would be classified, and he is not at liberty to restrict the scope of his book by leaving out sections ordinarily included in work of this character. In the I. C. S. textbooks, the student is given exactly what he wants and needs in connection with the particular line of study he desires to pursue. If he wishes to become a fireman of a stationary engine, and hopes that later he may become an engineer and perhaps have charge of a steam plant, he is offered a course of study suited to his requirements. The textbooks he uses have all been written especially for use in that course. The plan is to give every student exactly what he wants through textbooks with which the student can obtain the information in the shortest possible time. Each course thus has its own series of textbooks written especially for and adapted to it.

INSULATION OF STEEL PASSENGER CARS.

In the many articles describing steel passenger cars, little has been said of insulation. The Master Car Builders' Committee on Steel Passenger Cars, reporting in 1909 said:—"The whole question of material for inside finish, from the standpoint of insulation against heat and cold, has not been thoroughly worked out and is a subject to which manufacturers should give prompt attention, looking toward a speedy production of a serviceable product that is permanently fireproofed." Insulation against excessive noise in operation is also a factor to be considered, because a steel car without proper insulation will be colder in winter, hotter in summer and noisier all the time than a wooden car. This is based on the fact that both heat and sound are more readily transmitted through metals than through wood, although the latter does not rank high as a non-conductor.

A wooden passenger car would be a much more comfortable vehicle if well insulated. This being true, it is certain that the proper insulation of steel equipment for all year comfort, economy in heating and noiseless operation, is a necessity. It is equally certain that this has not been attained or even approximated in the majority of cars in operation today. Materials that have been tried can only be described as experimental.

The problem is serious enough to justify some modification of design, so as to permit more uninterrupted insulation. For instance, a semi-elliptical roof can be wholly insulated while a double-deck roof cannot.

In dealing with steel car insulation it must be borne in mind that the resistance of different substances to heat energy, and the rapidity of heat transmission through those substances is dependent upon their solidity. The most perfect insulators are materials which are filled with minute air cells, and experience has shown the high efficiency in quilted flax fibre, although cork board and mineral wool board, properly prepared, rank high.

Since the first steel passenger cars in the country were placed in service on the Illinois Central suburban trains in 1903, there has come some demand for fireproof construction throughout, practically confined to lines operating through subways, and into New York City through tunnels under the river. This demand for fireproofing extends to the insulation, although it would seem unnecessary considering the fact that the insulation may be enclosed in the shell of the car and protected by steel sheathing on both sides. The insulation problem of combined efficiency, light weight, durability and ease of application is simple without fireproofing, and has been solved by quilted flax fibre. Fireproof materials with some flexibility, which tend toward easy application, are produced, but lack both efficiency and durability. It seems certain that a fireproof insulation having both efficiency and durability must lack flexibility and be applied with steel or band iron ties. Not less than one inch of insulation should be used to obtain satisfactory results. When it is remembered that a steel passenger car weighs over 100,000 lbs., and efficient one-inch fireproof mineral wool board weighs only 1½ lbs. per sq. ft., the weight of the insulation is a small matter.

One important point must be observed. The sills, posts, plates and carlines are all conductors of heat and sound, and under present designs cannot be insulated, emphasizing the necessity for extraordinary insulation on all other surfaces of the car. Inefficient insulation, even though fireproof, is useless for the purpose designed, and the expense of replacement or repair prohibitive for obvious reasons. Good insulation is good insurance and has but a first cost. The Union Fibre Company, Winona, Minn., has given this difficult problem particular attention for two years. Steel car linofelt and fireproof steel car lith have been designed especially for the requirements of steel passenger equipment and have been tested and found satisfactory. Both materials are on exhibition at space No. 448.

NEW QUICK DUMPING ORE CAR.

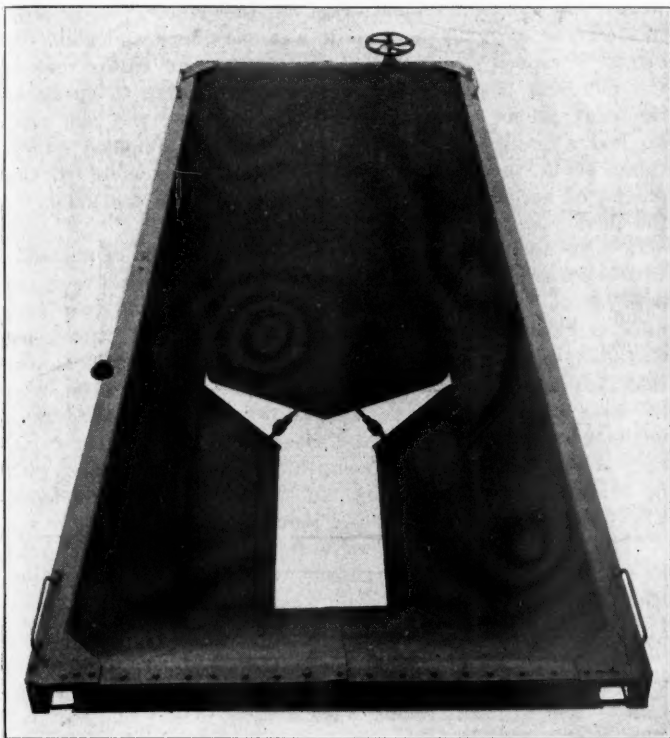
The development of cars to meet modern requirements of transportation of ore from the mines to the docks at points on the Great Lakes, and the unloading of the ore from the cars into the vessels, has been considerably hampered by the permanent and expensive construction of docks with pockets at regular short distances corresponding to those between the hatches on the vessels. Old wooden cars were built in accordance with these dimensions, which cannot now be changed without building new docks and changing the vessels, both of which are impracticable, as they would destroy interchangeability. This necessitates confining new cars to the same length and to nearly the same width and height as the old equipment.

Builders and designers of ore cars for this service are therefore required to work in accordance with strict instructions. These restrictions, together with the comparatively limited knowledge, immediately following the introduction of steel cars, as to the strength and endurance of steel in car construction, naturally resulted in the building of cars not especially adapted to rapid unloading. The question of a reduction in time and labor required to unload the cars has recently become of more importance. This is largely due to labor difficulties, but also in order to effect a more rapid unloading of vessels, as well as less detention of the cars. The railway companies have permitted a number of variations from the old standard dimensions, which permit more ideal ore car construction.

The Pressed Steel Car Company, Pittsburgh, Pa., has just completed a sample car, representing a lot of 300 which it is building at its Chicago plant, the Western Steel Car & Foundry Company, Chicago, for the Duluth & Iron Range and the Duluth, Missabe & Northern. This sample car, shown

in the accompanying illustrations, is of all-steel construction, with the following general dimensions:

| | |
|--|----------------|
| Length over striking plates..... | 22 ft. 1 in. |
| Length inside of body..... | 18 " 1 3/4 " |
| Width over side sheet..... | 8 " 7 " |
| Width inside of body..... | 8 " 6 1/2 " |
| Height from rail to top of side..... | 9 " 6 " |
| Height from rail to center of draw heads..... | 2 " 10 1/2 " |
| Length of door openings..... | 6 " 7 3/4 " |
| Cubic capacity, level..... | 686 cu. ft. |
| Cubic capacity, 10-in. average height..... | 802 " |
| Rated capacity..... | 100,000 lbs. |
| Maximum capacity..... | 120,000 " |
| Weight of car and trucks, empty..... | 32,700 " |
| Ratio of paying freight to total weight of loaded car..... | 78.6 per cent. |



Top View, Showing Doors Open.

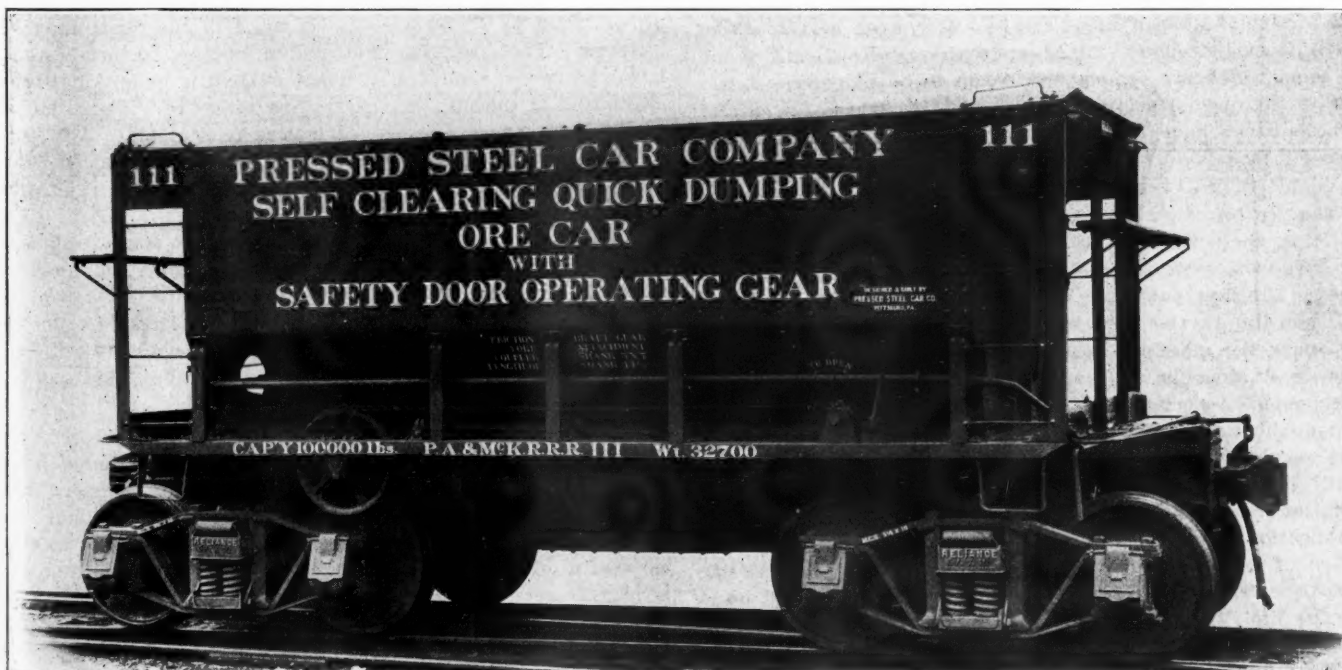
The car is of single hopper center dumping type, and in order to make it self-clearing, the area of the bottom open-

ing has been made very large, being about 50 sq. ft. The slopes of the hopper sheets are very steep, being 50 degs. from the horizontal at the ends and 60 degs. at the sides. These conditions were made possible without materially reducing the carrying capacity of the car, by increasing the height and width, reducing the wheel base of the trucks and increasing the distance between their centers.

The opening is closed by two doors hinged at the sides, which form a part of the vertical sides, so that when opened part of the side as well as the bottom falls away from the load, thus making a large unobstructed opening, reducing the chance of bridging to a minimum. The doors meet on the center line of the car and each is supported by two six-in. channel doors, to which the door operating gear bars are attached. The door gear may be operated from either side of the car. It is so arranged that when the doors are closed and the car is loaded there is no strain on the winding gear proper, so that the supporting mechanism is self-locking and the load tends to keep the doors closed. This is accomplished by cranks which turn over a dead center into a position of rest. The doors are connected to the cranks by heavy rods with screw attachment for adjustment, thus preventing stretching and leakage of ore in transit. Gears of this kind have given good service on coal cars and have the further advantage that when the doors are frozen so that they cannot drop by gravity they can be forced down by the connecting rods.

Another feature in connection with the door gear is a positive safety device which will prevent injury to the operator when opening the doors. To operate the doors the usual wrench is applied to the square end of the operating shafts. The crank arms are revolved by block clutches having clearance of half a revolution, which permits the cranks to revolve, after having been brought over the dead center, sufficiently to fully open the doors without moving the wrench in the operator's hands. After the doors have been open the clutches are in proper position for closing them, with no lost motion.

In a recent test made at the Clinton Furnaces at Pittsburgh, Pa., the sample car was loaded with 100,300 lbs. of wet ore and unloaded by one man. The time consumed by the ore in leaving the car was eight seconds. No ore remained in the car and no poking or hammering of the sides to loosen it was necessary. The car was afterwards loaded with



Self-Clearing, Quick Dumping Ore Car.

68,000 lbs. of steel punchings. This load was placed directly over the doors, and although this was a very severe test of the efficiency of the door gear, there is no sign of weakness or leakage. This car is now on exhibition on the track of the Philadelphia & Reading R. R., Mississippi Avenue, and will remain here during the convention.

HIGH SPOTS IN THE LIFE OF THE DAILY.

BY FRANCIS W. LANE.

"The nomadic habit of publishing a daily paper in half a dozen states in as many years has its charms and its excitements; but it is exhausting. Daily newspapers were not intended by Providence as articles of baggage."

These feeling remarks are found in an editorial paragraph in one of the issues of the *Daily* in its eighth year. Many of the forms of excitement that had appeared up to that date were peculiar to the comparative newness of the enterprise, the positive lack of capital and the inadequacy of facilities that could be found abroad or that could be transported from home. It is believed that no confidence is violated in the statement that the least of the early work of the office shears was that of manicuring bonds. At the time of the publishing of the first *Daily* by the *Northwestern Railroader*, that paper itself was only two months old, and its editor and publisher had only that length of experience in the publication of a railway paper. It was a heroic, not to say reckless, enterprise.

The daily that is now the *Daily Railway Age Gazette* is, and always has been, unique. The conditions under which it was started and under which it has been published for 24 consecutive years—with some extraordinary interpolations—were different from those which have surrounded the building of any other daily paper ever published. Not only this, but these conditions have changed with almost every year, and sometimes, in the early days, twice a year, even to the city or town (or "place," perhaps) of its publication.

Though the *Daily* has spoken for itself in tones which were not uncertain, even though their reproduction in printed form sometimes left something to be desired in the way of clearness, yet because of the ever-changing conditions under which it was brought out from year to year, there is a vast unpublished history of events which have had an influence upon the product. Most of these are forgotten even by those who were most thoroughly mixed up with and by them. Some of them which are remembered seem to be of passing interest to the special section of the public to which the efforts of the paper have been directed. It is the purpose of the present chronicle to tell some of the interesting and amusing incidents in its twenty-four years of life.

The *Northwestern Railroader* first appeared, as a weekly, in Minneapolis on April 8, 1887, under the direction of Harry P. Robinson, editor, and W. P. Hallowell, Jr., business manager. The first published mention of the *Daily* was on June 3, when the *Northwestern Railroader* announced its intention to honor the meetings of the Master Car Builders' Association in Minneapolis on June 14, 15 and 16, and of the Master Mechanics' Association in St. Paul the following week, by the publication of two daily issues each week in addition to the regular weekly issue on Friday. For several years, or until the associations happened to meet in places where printing facilities had been created sufficient to enable the publication of a paper without utterly depleting the home office of type and furniture as well as editors, the regular weekly edition of the paper was combined with the last issue of the daily for each week and thus published away from home.

In the first two numbers of its first issue the *Daily* had the facilities of its home office. The paper consisted of two

special numbers with eight pages of reading matter and four pages of advertisements. Apparently, there was not a large amount of discussion in the convention, or stenographic and printing facilities might have failed. The first number consisted largely of the reports on couplers,—then and for some years a very live topic—and on air brakes, the latter report being based on the famous Burlington tests. The second half of the issue, published in St. Paul, consisted of two numbers, each of four pages of reading matter and four pages of advertisements. The office was a desk in the lobby of the Ryan Hotel. It was found desirable to publish in one of the daily issues, as well as in the weekly of the preceding week, the complete constitution of the Master Mechanics' Association—possibly because it was easy copy and could be set in advance. Nevertheless, on July 1 the editor took a fall out of a contemporary who was promising to speak of the conventions next week, and gloated over the fact that he had already more than a week before published everything about them "from the alpha of convenement to the omega of adjournment," and had placed it in the hands of the members on the day following the event.

In 1888 the *Daily* began its first annual 1000-mile anabasis with Alexandria Bay as destination. It took along five members of the staff—two editors, a stenographer, and two business representatives—together with a small but varied assortment of type and printing office furniture. The slogan this year was, "Our light will not be hidden under a bushel." It came near suffering eclipse, however, in the darkness engendered by the fact of the location of the nearest print-shop at Clayton, 13 miles away as the crow flies, and with no means of communication but the crow except by boat. The plant was described when recollection was fresh:—

"The plant on which we were compelled to print was still in a printing-office only because it was so worn out that there was not enough of it left to be worth selling. That year we killed a foreman and spilled much blasphemy."

The paper was generally some hours late, owing to what were euphemistically described as "certain mechanical obstacles." The editorial rooms were a table in the office of the Thousand Island House. The first number, each number consisting of seven pages of reading matter and five pages of advertisements, commented feelingly upon "the great and holy purpose" enunciated by the associations of confining their work within one-session-a-day limits, since evening sessions were an abomination in a place where evenings were pre-ordained by Providence to be spent in the open air and idleness. The evenings and nights of the editorial staff, however, were spent in a place evidently under the pre-ordination of the opposite controlling influence. When, later, a prominent superintendent of motive power said:

"I believe you fellows would print your daily paper in hell if our meetings were held there," the only possible rejoinder was, "Of course we would; we've done it!"

It was in connection with this meeting that some comment was made upon the anomaly of holding railway conventions 13 miles from the nearest railway, and expression given to the doubt if the experiment would ever be repeated. But it was, in 1895. The same glorious evenings were still there. The same print-shop was still there with seven years' added decrepitude.

In 1889, in keeping up its record, the *Daily* was forced to double its pleasant exertions. The Master Mechanics held their convention at Niagara Falls and the Master Car Builders held theirs at Saratoga. It was bad enough to have to print a paper at all at Niagara Falls. Owing to the necessity, also, of getting out a regular weekly edition on Friday it required something of a "hump" to pack up and get the stuff removed and redistributed at Saratoga in time for another paper early in the week. Part of the hump consisted of a special train of an engine and one car. These various compulsory wanderings are marked in the paper

itself by considerable diversity of type faces, from the nice, clean-faced type carried from Minneapolis to the moth-eaten and charmingly diversified metal of a country shop. Varieties of paper occasionally appear in the same issue. This was not for the same reason that magazines are so made up at the present day.

In 1890 both conventions went to Old Point Comfort. If they had not united to this extent it seems possible at this pessimistic distance that one or other of the associations would have missed its "Daily." The printing-office at Old Point was not at Old Point at all, but at Hampton, four miles away, at the government training school, where young Sioux and Seminoles were instructed in the various arts of peace, including type-setting. The whole wigwam, as Wilson tersely stated (and did more tersely), was "annexed," and the paper got out with a variegated assortment of red, black and white labor, and with a somewhat similarly varied assortment of type. The means of communication between Old Point and Hampton were rather precarious, but it is possible that the difficulty of getting away from the printing office may have mitigated the hardship of staying there. On a later occasion there were found to be certain advantages in the presence at the school of a large supply of colored labor. But that story shall have a paragraph to itself in its proper place.

In 1891, at Cape May, frivolous editorials were written from the Mayor's official chair. His office was the editorial room. The real convincing editorials about the Cape May conventions and some of the features of them which appeared on settling day at the hotel were not written until later, when efforts were in progress to induce a repetition of the visit. Those would have been likely to melt any other type than that which had been so well seasoned in divers places. In 1892 began the pendulum-like movement of the associations which brought them to Saratoga in alternate years. About this time local printers began to sit up and take notice of the *Daily*, and saw that it would be good to ameliorate the conditions under which it was published and to recognize it as one of the features of the conventions to which it might be well to pay some attention. But they did not at once sit up so hard as to bump the ceiling. This year also marked a little eccentricity in the paging of the paper which was perhaps noticed by a few of its patrons. For the sake of better press work on the outside sheets and to save time, the covers were printed in advance. It was surmised in advance that the back cover page should be numbered about 20. It was so done. Unfortunately, reading matter could not be set to bring the pages up to more than 16 in some of the early issues. The gap between 14 and 19, however, was not so perplexing as the effect of this fixed final 20 in later issues when there was a surplus of matter, some of it of the kind that could be, and was prepared in advance. It always did cause a startled look when one had read pages 19, 20, 21 and 22, to find himself back again at 19 without tergiversation on his part.

But the characteristic feature of the 1892 convention, so far as the Master Mechanics' Association was concerned, was the presentation of the historic report on compound locomotives. So far as the *Daily* was concerned, the publication of that report was not only a feature, but pretty nearly the whole face and figure. The report came in late—Friday or Saturday—and the type, cuts and long tabular matter were in New York. When the reproduction appeared as a big 18-page supplement to the appropriate issue of the *Daily*, the Sabbath had been badly broken, the publishers were nearly so, and a bunch of dazed printers in New York and trainmen all the way from New York to Saratoga were wondering whether any Czarish ukase could have been printed and promulgated with more incessant and unrelenting vigor. The fine Russian (or "rushin") hand of one Wilson was solely responsible. But the report appeared at the proper time, notwithstanding the previous and probably unavoidable

official delays. It was particularly acceptable on account of a shortage of the official reports.

In that year the column heading "On the Verandah" will convey a notion of the extent of the exhibit of the supply interests. This meant the verandah of Congress Hall. Later the lawn in the court of the hotel was laid claim to for this purpose. In that year, also, "Conventionalities" for the first time appeared as a distinct department of the *Daily*, but not then had the enterprise grown so successful as to suggest anything lavish in the line of jokes. The men behind the guns felt more like murmuring quiet thanksgivings that nothing was any worse than it was. In that year the publication became the *Daily Railway Age*, consolidation with the *Northwestern Railroader* having taken place in the latter part of 1891.

The *Daily* of 1893 was edited at Lakewood, N. Y., and printed at Jamestown. By this time the movable staff had increased to three editors, one stenographer and four business representatives. Since the consolidation of the two papers, also, there was sufficient available staff material to warrant leaving some of it at home to get out the weekly. For the first time the editors shook hands with themselves over the creditable appearance of the press work; but, alas! for human vanity subject to the vagaries of a country printshop! Page 5 of one issue contains the self-congratulatory editorial on the beautiful presswork; page 12 bears some resemblance to an impression from a printer's case struck by lightning. Yet, "about this time," as the almanacs used to say, the resolutions of thanks from the associations, which the publishers felt in duty bound to print as a means of tipping over the bushel that might have obscured their light, began to become so numerous as to make their repetition almost painful. One or two jokes came to maturity this year, and were not refused space.

In the year of our Lord 1894—except that the last day of the conventions was evidently under some other jurisdiction—the first labor trouble arose. It was supposed in all innocence of heart and purity of mind that every kind of grief except lightning stroke and snake-bite had been endured, and that with comparatively little complaining. But when the last day's issue was in the printing office and the work was so nearly finished that settlements were being made with the compositors who had been gathered in from New York, Albany and elsewhere—the pendulum had swung back again, and we were at Saratoga—it was discovered that some of these men, "charming fellows, all of them," the editor said, had been assiduously "doctoring their strings," which in newspaper parlance means doping their records to make it appear that they had set more type than they had. It was impossible to separate the sheep from the goats, and they were all turned out bleating and "meck-meck"-ing into a cold world. The jail, almost next door, yawned for them, but it would have caused a delay to take the preliminary steps toward putting them there. On that day it was fine that the bulk of the "must" matter was in plate form—reports, etc., which had been prepared before leaving Chicago. With the assistance of the foreman, who was not implicated in the attempted steal, and availing of some experience in emergency type-setting necessarily acquired in previous years by some of the staff, editorial and miscellaneous matter to the amount of one page was set, the stenographic report of the last day of the convention was boiled down to two-thirds of a column, and a 20-page paper appeared as usual next morning.

(To be continued.)

Before the advent of the locomotive in France between the years 1823 and 1827, railway concessions were first granted with a view to provide improved communication between the centers of production and the waterways of the Loire and the Rhone.

STAFF'S DREAM.

A sort of serio-comedy, in two parts—top and bottom (water on the side).

Mould, Before and After Pouring.

Staff.....B. E. D. Stafford
The CometHalley
Jim.....Nat Tube Goodwin
Youngster.....Dave Champion's Son
First and Second-Story Men, Listeners, Butters-In, Reminiscencers, Jokers—real and thought-so's.
Time: Foremen Boiler Makers' Convention.
Place: Niagara Falls.

ACT I.

A room below stairs; tables; chairs; numerous bottles, etc. (principally, etc.); the full company.

Jim: Well, Staff, it's up to you. We're all in.

Staff: Boys, I'm going to tell you a dream I had last night: I went to bed rather late and had just dropped off to sleep when the telephone bell rang. I didn't think it was time for the morning call, so I jumped out of bed and grabbed the receiver.

"Well?"

"Is this you, Staff?"

"Yes; who is it?"

"Why, this is Halley."

"Halley? Hell-oh! Halley who?"

"Why, Halley, the comet man."

"Oh, is that you, Halley? How are you? What brings you around?"

"I understand the boiler foremen are having a convention. Know anything about it? Thought I'd come if there is a good crowd."

"Yes, there is a convention, and the crowd is all right; but what has that got to do with you, Halley?"

"Well, I'm something of a boilermaker myself."

"A boilermaker? What have you ever done for the boilermakers, Halley?"

"Why, don't you remember, I fixed up the first locomotives about 75 years ago—the last time I was here."

"No, Halley, you can't prove it by me; but if you did, you fixed the locomotives all right, so as to keep the boilermakers busy. But what are you going to do for them this time, Halley?"

"Why, Staff, you ought to know. I've done it already."

"Put me next."

"Haven't I given them the Tate flexible staybolt so as to make it easy for 'em?"

"I'm on, Halley; I'm on. You're all right, and I know it. But say; what do you want to haul a fellow out of bed for? O, excuse me, Halley, you're another night owl. I see."

"No, Staff, I've got a message I want you to give the boys. I've been holding back this comet to show it for the first time at this convention. I know a lot of the boys will be sitting up and I will show it for the first time over Niagara Falls tomorrow night. Get busy. Goodby."

Youngster (as he bounds into the room as Staff finishes his story): Halley's comet! The comet is in sight. Come, quick! Come up on the roof! The comet is right over Niagara Falls!

ACT II.

Scene: Partly 60,000,000 miles away and partly on the roof, which only seems so (the elevator is not running).

First and Second-Story Men, Listeners, Butters-In, Reminiscencers and Jokers: They at first hesitate, and then have followed the youngster to the roof. The Comet appears R. U. E. in all the glory of a safety match.

Problem: Did the boy lie, or what kind of glasses did the observers use?

Conventionalities.

Edwin Strassburger, western sales manager of the Buffalo Brake Beam Company, is paying his annual visit to the east to attend the convention.

F. C. Dunham, special sales agent, and E. D. Hillman, mechanical engineer, of the U. S. Metal & Manufacturing Company, arrived Monday.

C. A. Schroyer, superintendent car department of the Chicago & Northwestern, stopped off at Philadelphia on his way to attend the conventions, reaching Atlantic City Tuesday.

Fred Atwater, effervescing champion of lock nut fame, hit the Boardwalk Monday. He has since cornered enough sea breeze to last through the convention and will turn a little loose each day to help expound the cause of hale Columbia.

J. Bill Johnson, heap big chief of the entertainment committee, is certainly up against it this trip. He's got thirteen submitters (all alive; count 'em); and has actually put a Farmer in charge of those who will run tonight's M. C. B. reception affair!

J. F. DeVoy, carrying as quietly as he can and withal very modestly, his recent honors—the title of assistant superintendent of motive power and the presidency of the Western Railway Club—put in an appearance on Tuesday, and registered among the first.

It is confidently asserted that C. A. Seley, mechanical engineer Rock Island system, has recently amassed more information—and mis-information—about safety appliance matters than he would be able to present to the association, even if there were three sessions a day instead of two.

All conventionites not satisfied with the weather are officially advised to register their complaints with Albert T. Bell, ex-president of the Atlantic City Hotel Men's Association. It was "nominated in the bond" by Mr. Bell that the weather would be perfect for two weeks, beginning this morning.

Friends of W. E. Fowler, past president of the Master Car Builders' Association, whose resignation from the Canadian Pacific on account of ill-health we were unfortunately obliged to note last year, has sufficiently recovered his health so that he is enabled to be with us this year. Mr. Fowler accompanied by Mrs. Fowler and the Misses Fowler.

J. J. Hennessey, exercising equally an efficient guardianship over the car department of the Chicago, Milwaukee & St. Paul, and over matters of repair in interchange as the chairman of the arbitration committee of the Master Car Builders' Association, was among the members of the Old Guard who were early to register.

Ladies in attendance at the ball of this and next week will appreciate the thoughtfulness of the entertainment committee in providing the attendance of maids in the ladies' dressing room, who will render any required attention during the evening. It should be remembered, however, that such attentions will be available only to those who are provided with the proper badge.

This is the week when Tom Aldcorn gets in his work with Chicago Pneumatic drills on the pockets of representatives of exhibiting companies. It has been suggested that he make the job more thorough by afterwards calling in the assistance of some of the numerous vacuum cleaners to gather up any dust that may escape his first investigation.

One Brazier, whose full name is Fred. W., is one of the decreasing number of men in the mechanical associations who

admits that he is a car man first, last and all the time, and not only admits but claims it. (The fact that Mr. Brazier says he was born and learned to eat "pi" in a Boston print-shop is the only necessary apology for seeming to use his name with undue familiarity in view of his dignity as a past president.)

"Whistle and I'll come to ye, my lad," is the way one of the earlier poets expressed the compelling influence of puckered lips. On Wednesday evening the invitation will be presented in a more attractive form and a general acceptance on the part of the "lads" may be expected when Mrs. Alice Shaw, "la brillante siffleuse," who is understood to have been engaged at the suggestion of Mrs. F. H. Clark, will entertain at the Master Car Builders' reception at the Blenheim exchange.

It is related that Eugene Chamberlain, chairman of the freight car repair pool, New York Central Lines, and who arrived on Tuesday, has entirely forsworn since last year the use of safety matches of the kind in which the safety consists in the fact that they always go out just half way between the box and the end of a cigar. In talkative or thoughtful moods—he sometimes has them—he has been known to use half a box to one cigar.

Postlethwaite happened in the nick of time.

Poste's always physiological, any way.

It seems that some one located his best ever Ore car in the wrong state and the Exhibit Man of the *Daily* was tipped off accordingly. It got into type and would have gone further but for Poste who exacted a correction as smoothly as if it were an order for pressed steel cars. The compositor has switched Arkansas into Mississippi, and all is well.

Invitations to the receptions—the Master Car Builders' reception on Wednesday evening of this week and the Master Mechanics' reception on Monday evening of next week—have been mailed to every member whose name was on the lists of membership 30 days ago. For the benefit of new members, guests, and others who may be entitled to receive them, invitations will be inclosed in the envelope in which the badge is contained and which will be delivered upon registration, to all who register for the Master Car Builders' Association before 6 P. M. on Wednesday and for the Master Mechanics' Association before 6 P. M. on Monday.

Our railway and railway supply friends have their fads and fancies, just like the rest of us. Assistant General Manager Bracken, of the Union Fibre Company, is no exception to the rule. Next to his family, Mr. Bracken loves his books, his old prints and his etchings and the best place on earth, in his opinion, is his own library in the pleasant Bracken residence in Winona, Minn. Mr. Bracken was admitted to the bar, but gave up the practice of law to become assistant postmaster in the city of St. Louis. He has also seen railway service with the Merchants' Bridge & Terminal Railroad of St. Louis. In recent years he has devoted considerable time to the study of the constitution of the United States, purchasing so many authorities on the question at one time that, according to his friends, in order to avoid the family scowls, he evolved the successful scheme of smuggling the precious books under his coat and vest on entering his home at nights.

WEAR YOUR BADGE!

The Entertainment Committee announces that all members and guests will confer a great favor upon the committee and save themselves possible annoyance and inconvenience by wearing the official badge at all times prominently displayed.

The Exhibit.

Excelsior is the foreword of the Gold Car Heating & Lighting Company, New York, this year. This company's excelsior vapor valve, which can be used with or without drop, is worthy of inspection.

A. J. Gardner, Jr. and Thomas H. King, well known representatives of the Landis Tool Company, Waynesboro, Pa., are here for several days. They are particularly enthusiastic over the engine work being ground on the Landis improved grinders, and the possibilities for the extending use of grinding machines in railway shops.

Representatives of the Dearborn Drug and Chemical Works, Chicago, in attendance at the convention are George B. Carr, vice-president and general manager, and J. D. Purcell, vice-president, of Chicago; Grant W. Spear, vice-president and eastern manager; and H. G. McConaughy, of New York, and A. W. Crouch, district manager, of Pittsburg, Pa.

The ball room and other floors of the pier are kept clean during the conventions by the frequent use of the Duntley pneumatic cleaner. These effective machines, which were almost a new invention a year ago, have, during the year, been introduced into every part of the country almost as commonly as brooms and with none of the disagreeable features of the operation of the latter.

The office of the Cowles-MacDowell Engineering Company, Chicago, has been moved from the Rector building to 1632-1634 McCormick building. This company installs hot water washout and refilling apparatus for round houses, and automatic vacuum heating plants for railway buildings. Irving Cowles is president; E. H. MacDowell, vice-president and treasurer; and Charles L. Sullivan, sales manager.

The Kewanee union requires no introduction to the mechanical men who have been brought together here by these conventions. The union, with no inserted parts, is known wherever unions are used. However, it is almost a truism that one cannot have too much of a good thing, and we, therefore, direct the attention of our readers to the exhibit of the National Tube Company, Pittsburgh, Pa.

The Independent Pneumatic Tool Company, Chicago, is showing a one-piece long stroke riveting hammer, the barrel and handle being drop forged. No coupling is required for holding the handle and barrel together and the manufacturer claims the trouble heretofore experienced from a leaky joint, causing loss of power, and delay on account of handles coming loose, is entirely eliminated. While this hammer is new and novel in construction, it needs no introduction, as they are in general use on railways throughout the country.

Among the journal boxes exhibited by The T. H. Symington Company, Baltimore, Md., this year is an electric motor truck box designed for the several hundred electric cars now being built for the Southern Pacific. The lid is of the Symington pivot type, with central spring pressure and machined joint. The pedestal ways are machined, making possible a close and parallel fit between the journal box and pedestals. The journal box shown is for a 5 x 9 journal, and weighs, complete with lid, 109 lbs. The light weight is a feature, and is due to the use of a special grade of air furnace iron manufactured by the Symington Company. It is claimed for this metal that it has from two to three times the tensile strength of good gray iron, and that, owing to its close grain, has very superior wearing qualities.

SAMSON SIGNAL CORD.

A very reliable and economical signal cord is that made by the Samson Cordage Works, Boston, Mass., which company makes extra quality braided cord of all kinds. Samson cord is made of fine, even yarn, braided hard and smooth. It is carefully inspected, and is guaranteed free from the imperfections of braid and finish. It is made in a variety of sizes and colors, with or without a wire center, for bell cord, air brake cord, whistle cord, engine bell cord, etc.

Samson Signal Cord and Trade Mark.

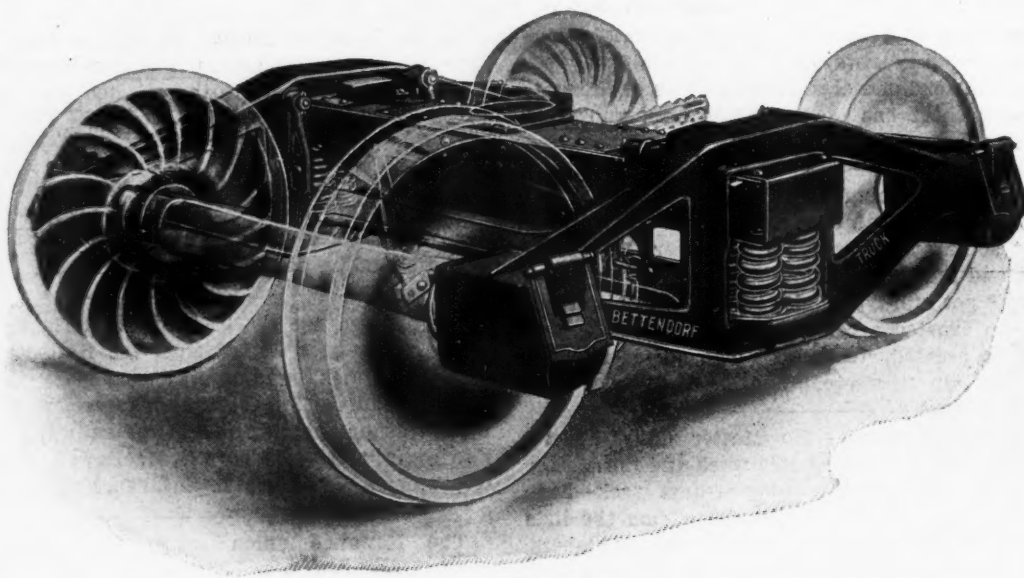
The manufacturers, the Samson Cordage Works, Boston, Mass., will gladly send samples and full particulars on application.



The truck frame is so built so as to be interchangeable with any standard truck frame. Any width of wheel base, design of journal box, height of bolster opening, etc., are possible without interfering with the general feature of the design. A distance of at least 4 in. is obtained between the lower arch bar and the top of the rail. It is claimed that the frame will skid along the roadbed in case of derailment, and not tear up the track, since there are no loose bolts, nuts and parts of the frame to catch on the ties.

The journal boxes are cast integral with the frame, and of any standard design. There is a lug on the bottom of the journal box which may be used for jacking up when the truck is under a car.

The bolster openings are of the shape illustrated for the rigid bolster. The design of Barber roller construction and swing motion bolster provide straight column guides. There is a hole cast in the bottom arch bar, on which a projection



Freight Car Truck with Bettendorf Cast Steel Truck Frames.

BETTENDORF CAST STEEL TRUCK FRAMES.

The first step in the manufacture of cast steel truck frames is to set a metal of the requisite composition. Basic open-hearth cast steel is used in the side frame illustrated herewith, and is of a composition which affords a high elastic limit. In a derailment the frames may be bent out of shape, but it is claimed that they do not break and, in most cases, may be straightened and put back into service.

The Bettendorf truck frame is a one-piece casting with arch bars, columns, spring seat and journal boxes cast integral with the frame. This construction gives a simple design which eliminates bolts and rivets. This latter feature is very important in truck frame construction, as there are no column and oil box bolts and nuts to become lost or broken.

Another important advantage is the reduction in weight which the one-piece frame affords. To illustrate approximately, these frames gave a reduction in weight of about 1,000 lbs. per car.

The distribution of metal is designed effectually to resist all stresses, allowing a high factor of safety, and so that the frame will carry a greater number of load pounds per pound of truck frame than the ordinary arch bar frame. This latter feature is not due entirely to careful designing, but also to the construction of the frames.

on the spring plank is secured. In this way rigidity is overcome to the extent that the truck is adjustable to track irregularities, and at the same time flange wear on wheels and end wear on brasses are reduced to a minimum.

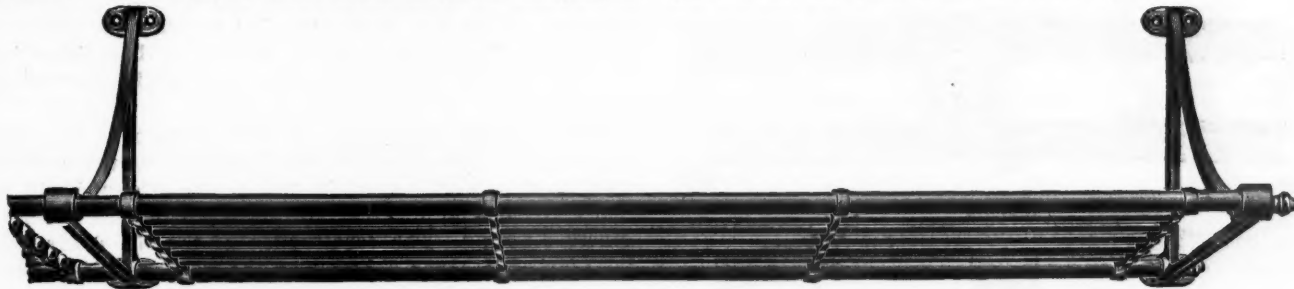
Each side frame is tested before leaving the Bettendorf plant, thus insuring the squaring of the truck frame. The number of operations required to assemble a Bettendorf truck is a minimum because of the small number of parts. The ease with which the assembling and dismantling is done is shown daily at the exhibit of the Bettendorf Axle Co., Davenport, Iowa, in space 200.

FORSYTH METAL DOORS.

Forsyth Brothers Company, Chicago, has for some time been manufacturing and furnishing the trade with a metal door in which not only the frame-work but the entire door, including panels, is formed substantially out of one piece of metal. It seems reasonable, that a door thus built is much stronger and more durable and economical than one composed of numerous parts, such as frame members, panels, etc.

In the Forsyth door there is no overlapping of metal sheets, which tends to retain moisture and start rust formations. Further, the forming of the panels and other parts of the

Forsyth door in one piece not only strengthens the latter for the same reason that corrugations formed in sheet metal do, but at the same time obliterates any inequalities in the metal, as well as strengthens the metal itself. The door is thoroughly protected from rust formation both inside and out; is reinforced throughout; and is sound-deadened. Notwithstanding the extra cost of manufacture of this one-piece door over a built-up one, Forsyth Brothers Company is



Removable Bottom Basket Rack, No. 262.

offering it to the trade at a price which will compare favorably with that of other metal doors.

Among the companies on a large number of whose cars the Forsyth one-piece metal doors is being applied are the Harri-man Lines: Chicago, Milwaukee & St. Paul; Hudson & Manhattan, and Interborough Rapid Transit (New York).



Forsyth Metal Car Door.

REMOVABLE BOTTOM BASKET RACK.

The removable bottom type of basket rack is becoming very popular on account of its adaptability to the varying conditions of passenger car service. In the same way that the continuous type has practically displaced the individual rack the removable bottom type is being rapidly adopted in place of the unwieldy non-removable bottom.

In the event of damage to any particular section of the old style continuous rack, it was necessary to remove all sections and brackets up to the affected part before it could be taken out for repairs or replacement. This is a very expensive proceeding, aside from the fact that whenever the screws are removed from the panel the holes are enlarged and require plugging, rendering them less secure each time, until there is danger of the rack breaking loose and allowing the contents to fall on the heads of passengers.

With the Adams & Westlake Company's patented removable bottom basket rack, it is only necessary to remove the damaged part and replace it with an interchangeable section; or put back the old one when repaired, without disturbing the brackets or the sections on either side.

The illustration shows this company's pattern No. 262, which combines the feature of quick removability with rigidity and security. This company has several different types of removable bottom racks to meet different requirements, both as to appearance and mechanical detail.

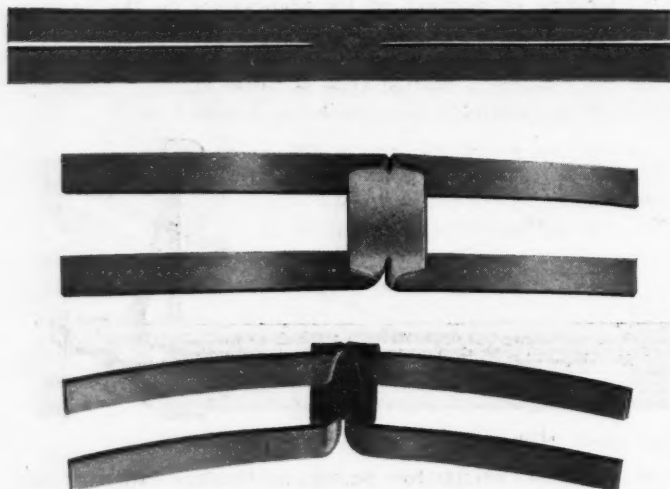
The Adams & Westlake Company, Chicago, manufactures a large variety and number of patterns of general car hardware, such as door locks, sash locks, sash lifts, seat fixtures, coat and hat hooks, vestibule fittings, etc.

DAVIS STEEL BACK BRAKE SHOE.

Great numbers of brake shoes are lost by breaking in pieces when the shoe is only partially worn, and new shoes are also lost by reason of the rupture of the thin portion of the lug through which the brake shoe key passes and against which the key presses. To overcome this difficulty, it has become common practice to cast rods and plates in the back of the shoes so that if the shoe cracks it will be held together by the wrought iron pieces. While these methods are an improvement on the old style plain shoe, it does not altogether preserve the shoe, and the rods are so thick as to make an undesirable combination.

The Davis solid steel brake shoe backs remedy these defects by reason of the back being made in one piece from a thin strip of metal (1½ in. x 3-16 in. x 15¼ in.) which, on account of its peculiar form, engages at all points with the iron cast about it. A cross section of the shoe at the center of the lug shows the full strength of cast metal; it is not cut through by plates or bars as in other devices; the Davis back arches up and over at this point. The strap forming the lug, and the forks forming the plate are in one piece, making it impossible for the lug strap to pull out. As a foundry proposition, Davis steel backs are perfect, being much

more readily placed in position in the mould than backs composed of several pieces. These steel backs may be seen



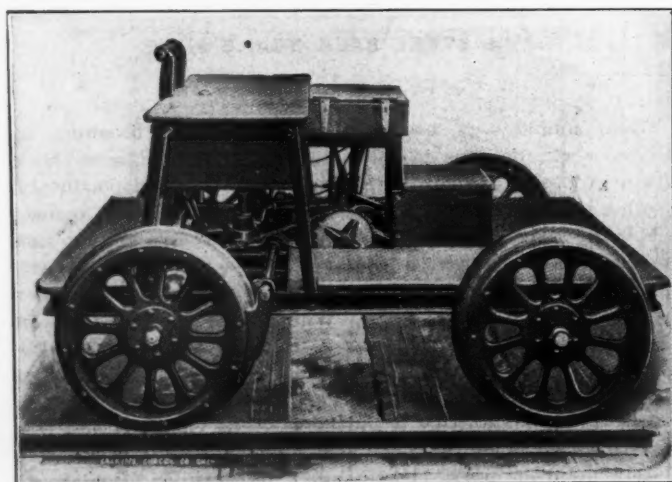
Steel Back of Davis Brake Shoe Before and After Being Pressed to Shape.

at the exhibit of the Davis Solid Truss Brake Beam Company, spaces 414-16-18.

ROCKFORD MOTOR CARS.

The illustration herewith shows the No. 8 Rockford motor car made by the Duntley Manufacturing Company, Chicago. This design of car is made in two sizes, No. 7 and No. 8.

The No. 7 car is the most powerful built by this company. It has 4-in. x 5½-in. cylinders arranged in pairs and opposing each other. Each pair acts on opposite ends of a single long piston and both pistons actuate a single pin which passes through the center of each and drives the connecting rod, necessitating but one throw in the crank. The use of four pistons in this manner insures the continuous application of power twice each revolution, with the care of only one bearing at each end and one connecting rod. The cylinders are air cooled, as the direct connection to the rear axle makes it impossible to run the engine without putting the car in motion.



Rockford No. 8 Motor Car.

A single carbureter is used, of a design similar to that of this company's No. 4 car. It is controlled by a single lever concealed in a depression in the seat deck and covered when not in use, as are the switches and compression relief levers. Of the latter there are two, making it possible to cut out either pair of cylinders when maximum power is not desired.

The frame is rigidly constructed of steel channels braced with angle steel. An ample running board deck for tools for a rail or two, or for other freight, is provided on each side of the central seat deck, which is similar to that of the No. 4 car and has a seating capacity of eight men. This deck, however, is noticeably different from that of the No. 4, in that all controlled levers except the brake are placed below the level, and consequently more protected from accidental damage. When not in use, the lids covering these and the battery and tool boxes may be fastened with a single lock, thus preventing tampering with the car in the owner's absence.

The No. 8 car is similar to the No. 7, except in the following details: The cylinders are 3 in. x 5½ in., the seats run transversely directly over the rear power axle, and will seat about five men, although it has ample power for a number of others standing. The construction of the No. 8 car, while very strong, is much lighter than the No. 7, as it is intended more for inspection for rapid traveling with a few passengers than short hauls of a heavy gang with tools, etc.

The No. 7, a 25-h.p. car, weighs 950 lbs., complete. It will run 40 to 50 miles an hour, and will carry eight to ten men with tools and other material. The No. 8, a 15-h.p. car, weighs 550 lbs., and will run 40 to 50 miles an hour.

THE BAROL LEECHES.

Don't fail to see the brown-skinned peaches,
The famous family of Barol leeches.
Born a million years ago,
They're the liveliest ancients in the show.
And if you want to see 'em squirm,
Just put 'em next to a nice fat germ.
Their name is Carbolineum,
Don't say it if you're chewing gum
And don't think they are only fakes,
But come around and see the snakes.

"Barol" is the trade name for a combination of carbolineum (a distillate of coal tar) and antiseptic copper in solution, used in the preservation of wood structures.

The U. S. Metal & Manufacturing Company, New York, is the general railway agent for this material, and full information can be obtained at booth 337.

DEVELOPMENT OF MICA LAMP CHIMNEYS.

As an illustration of the trivial events which frequently open new fields of enterprise, the development of the mica chimney business is an example.

A. P. Storrs, manager of the railway department of the Storrs Mica Company, Owego, N. Y., in a conversation with some friends, referred to this subject. It seems that he was president of the local gas company of Owego at the time that the Welsbach incandescent lamps were introduced in this country for use in gas lighting. He had one of the new lamps over his desk in the office of the gas company. This light happened to be located where a current of cool air was constantly in motion and the breakage of a chimney was a frequent occurrence. The annoyance of frequently replacing the chimney and often the mantle influenced Mr. Storrs to cast about for a means of preventing this trouble. He secured a large sheet of perfectly clear mica, rolled it into the form of a cylinder, put it on the light and had no further trouble. This suggested to him the possibilities of the mica chimney as a commercial proposition. He devised a practical construction whereby a permanent cylinder could readily be made of this material and started the new device among the gas companies who had already felt a need for something of the kind. Incidentally, Mr. Storrs remarked that on looking up the history of the use of mica it was discovered that it antedated that of

glass for lamp chimneys, as it is a matter of record that lanterns glazed with mica were part of the equipment of Columbus' ships on the occasion of his memorable voyage.

As some of the railway companies began to use the Welsbach lights for station and office lighting, the mica chimneys came to the notice of railway people. They called Mr. Storrs' attention to the fact that the consumption of chimneys on locomotive headlights and other oil lights used by the railways was very large and suggested the application of mica to this field. This was taken up and after repeated experiments Mr. Storrs devised a construction suited to this purpose which has come into wide use by the railways.

HOSE TROUBLES ELIMINATED.

The failure of hose used in air brake or signal line service is not only troublesome, but it often causes expensive delays, and sometimes loss of life and property.

The exhibit of the Sprague Electric Company, New York, booth 322, is of sufficient importance to justify each delegate taking time enough to investigate the merits of the Sprague electric steel armored hose which is on exhibition. It is claimed that this hose is sufficiently flexible for all requirements, and that the evil effects of contraction and expansion are eliminated by the close-fitting steel armor, which also prevents chafing and kinking. This hose is made to stand a test pressure of 1,500 lbs. per sq. in. The standard fittings are secured by clamps to the shoulders on the nipple and coupling and thus blow-outs are prevented, and when the rubber deteriorates, the armor is designed to bind the rupture to such an extent that the air brake will not set.

CHAMPION RIVET COMPANY.

When the Champion Rivet Company, Cleveland, Ohio, began business over 15 years ago, it was a very difficult matter to interest users of rivets in its product, as the market at that time was almost exclusively in the hands of the manufacturers of iron rivets. However, with the advent of low phosphorus and low sulphur open hearth steel, the company was enabled to put on the market a rivet of superior quality. Its daily output is in the neighborhood of 200 tons of rivets per day. All its rivets are made from the highest grade of low phosphorus, low sulphur steel confined exclusively in its manufacture to the product of one large concern that works especially in this company's analyses. The product consists of rivets $\frac{1}{2}$ in. diameter and larger, also air brake and coupler pins according to standard specifications.

W. H. S. Bateman attends the convention as representative for this company and also for the Parkesburg Iron Company, Parkesburg, Pa.

KARBOLITH FOR STEEL CAR FLOORS.

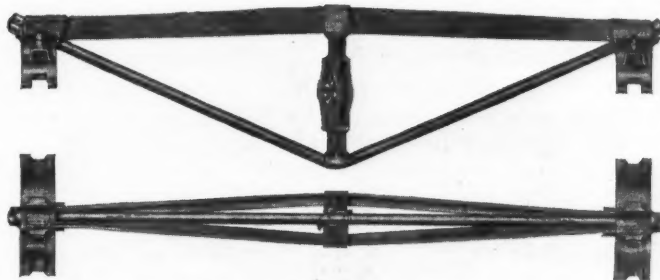
After several years of business in the steel car floor line, the American Mason Safety Tread Company, Boston, Mass., is now putting on the market a flooring composed of car Karbolith, which is a cement, very light, strong and fireproof, on top of which is put $\frac{1}{4}$ in. of Karbolith, which is very fine grain and has great wearing qualities, as well as non-slipping. This will last about as long as the car will, and will always look well. The top can be made almost any color, although red is preferable.

Another flooring is Karborundum Karbolith Surfacing, the underbody being made of Karbolith and the top, $\frac{1}{4}$ in. thick, of Karbolith with carborundum mixed through it. This has given excellent satisfaction in the cars of the Interborough Rapid Transit and the Hudson & Manhattan. The company has orders on hand now for several hundred cars of this kind, and reports that the greater part of the steel cars made up to the present time have its floors.

BUFFALO No. 400 DOUBLE TRUSS BRAKE BEAM.

The accompanying illustrations show the new No. 400 double truss brake beam of the Buffalo Brake Beam Company, New York. Tests of it show excellent results, both direct and transverse, and it should be entirely safe as regards buckling or doubling up in the center.

Samples of this beam, together with Buffalo solid and



No. 400 Double Truss Brake Beam.

special brake beams for passenger, freight, tender and electric service, may be seen at the company's booth, spaces 490 and 401.

CAR ROOFING.

A display of interest this year is the exhibit of a prepared canvas car roofing—the Bayonne roof and deck cloth—manufactured by John Boyle & Company, Inc., of New York, at their Bayonne, N. J., factories.

Cotton duck has long been recognized as a most suitable car roofing, possessing the requisite tensile strength and flexibility. The one fault has been that paint applied to the raw duck has a tendency to burn the fibre, shortening the life of the roof.

This is overcome in the Bayonne process. Besides keeping the dampness out, paint is prevented from reaching the fibre, assuring longer service. Another important feature is that the treatment thoroughly permeates the fabric, so that there is no liability of peeling.

In this connection the report of Charles V. Bacon, analytical chemist, Bayonne, N. J., is of interest:

"I herewith render you final report on your Bayonne roof and deck cloth, which I have had under observation for the last several months, making in and out door exposure tests, and state substantially that as you have used neither raw nor boiled oil but especially prepared linseed oil scientifically treated and applied in such a manner as to practically become a part of the fabric, you have eliminated the features which are undesirable in the so-called oiled goods.

"Upon examination on the various colored materials, I find that the pigments are mainly natural oxides which are not affected by dilute acid or alkali and have the best wearing qualities of any pigments, being able to stand the most severe tests.

"Regarding physical properties, I find the tensile strength increased. After exposure tests there are no signs of checking or chalking and the surface is in perfect condition to be painted, which is almost impossible with painted goods. The elasticity remains constant even after exposure, and to such an extent that the cloth may be folded and turned over sharp corners without breaking.

"On dissolving the oil-like composition, I find it to be practically free from fatty acids and the fibre has undergone no change whatsoever. The above features clearly demonstrate that although the goods have been thoroughly waterproofed and the wearing qualities improved, they have not undergone any change or been affected in any way. The absence of fatty acids eliminates all fear of there being any danger of saponification should paint be applied."

IMPROVED NATIONAL LOCK WASHER.

The National Lock Washer Company, Newark, N. J., makes over 600 different sizes and styles of nut locks. The steels used are made to its own specifications, and must pass the most exacting analytical and physical tests before acceptance.

The machinery used in manufacturing is of special design, fully protected by patents, and owned by the company. The apparatus for, and methods of, heat treatment are also exclusively controlled by the company, being automatic and scientifically accurate in result, whereby the highest efficiency attainable is realized. The finished product is subjected to the most rigid inspection and exhaustive tests for resiliency and toughness that its engineers and mechanics can devise before the goods are permitted to be shipped.

A minute and comprehensive system of record is employed in which every detail of analysis, manufacture and test from start to finish is kept, a feature of great value in duplicating orders.

The improved National lock washer is made of special acid open hearth steel, oil hardened and tempered. The claims for it are: It takes up vibration; a shorter bolt can be used with this lock washer; it is the most economical nut locking device on the market; it is superior to a double nut, lock nut or cotter pin construction, for although these prevent separation of nut and bolt, looseness occurs from stretch of bolt and wear of parts, and initial looseness in moving machinery increases in rapid ratio. It is guaranteed against breakage and loss of spring power.

GUTTA-BALATA BELTING.

Gutta-percha and balata have been used in the manufacture of belting in Great Britain and the European countries for a number of years. Balata belting has been extensively used abroad, and its efficiency and value as an important factor in power transmission are generally well known.

The Boston Belting Company, Boston, Mass., manufacturer of this type of belting, is now offering gutta-balata belting, a product said to compare very favorably with all other balata belting. It is made of very heavy duck, closely woven from hard, twisted, long staple cotton yarns. This duck is treated and then impregnated and coated with gutta-balata compound. The duck thus prepared is then carefully cut and folded so as to make what appears to be two separate belts, although not necessarily of the same number of plies or thicknesses. The selvage edge of each belt is then given a special coating. The two belts are then united, and, it is claimed, in such a way that the bond between them is stronger than that of any other plies in the belt. The seams or joints in the duck are in the interior of the belt. The above method of belt manufacture is covered by the Forsyth patent.

The claims made for the gutta-balata belting, four ply and heavier, made under the Forsyth patent method, are that it is seamless and that the strength of the gutta-balata compound prevents separation of the plies. It has friction surfaces on both sides, so that either can be run next to the pulleys or with a tightener or idler.

Should a gutta-balata belt slip, the heat due to the friction is said to cause its surface to become slightly adhesive, giving a better grip on the pulleys. Moisture to an ordinary extent does not seriously affect the adhesion of the belt, but heat in excess of about 125 deg. is objectionable. This belting is waterproof and requires no dressing. When its surface becomes dry or considerably worn, a very light application of castor oil or boiled linseed oil should be applied. If used as a cross belt, a small amount of floated plumbago should be used.

This belt may be used with straight conveyors or elevators, and also on high-speed pulleys or where grease or oils come into contact with the belt. The best results and greatest economy are derived from the use of wide thin belts in pref-

erence to narrow thick ones. The ends of a belt should be cut at right angles to the edges. If rawhide lace is to be used, the holes should be punched in line. The Boston Belting Company strongly recommends the use of wire lacing or suitable metal fasteners. Care should be taken that the holes are all equally distant from the ends of the belt, so that the strain on the lacing or fastening may be uniform and equally distributed. In every case the ends of the belt should be firmly butted and well drawn together.

M. C. B. REPAIR AND DEFECT CARD BOX.

A soiled repair card is often as difficult to decipher as a ticket calling for your "clean" ones in a Chinese shirt renovating emporium; hence, the surest way of obtaining a clean readable bill of expenses is to box the card. The U. S. Metal & Manufacturing Company, New York, booth 337, has eased

**M. C. B. Repair and Defect Card Box.**

the troubles of Rule 76 in evolving a galvanized iron box that can be attached to any type of car underframe.

A cordial invitation to see the device used in promoting "a clean card game" is extended to all who have seen the "spots" on the cards and know that they do not always give a square deal when they have to go it blind.

DIAPHRAGMS.

The question of diaphragms for car vestibules has become an important one to the railways of this country. The maintenance of the diaphragm has become an important factor in the maintenance charges of the entire car. The wear and tear on a diaphragm is, of course, very great. The Curtain Supply Company, Chicago, is putting on the market and exhibiting at its booth four grades of diaphragms which are built to meet the hardest conditions of actual service. These four grades differ in their specifications and prices.

The company recommends most strongly its CSCO diaphragm, claiming that this is the best on the market to-day. It is made in six pleats, of the best three-ply cotton duck, dyed with fast black dye and bound with binding made especially for this purpose. The peculiar system of reinforcing the corners prevents the tearing apart of the joints or sagging of the diaphragm corners, thus doing away with the two most objectionable features that have existed in the past. The presence of the rawhide foot used in connection with the CSCO diaphragm prevents the rotting and tearing of the feet.

The Rex diaphragm is built along the same general lines as the CSCO, but differs, in that it has a somewhat cheaper binding, does not have the special rawhide foot and the reinforcing pieces are somewhat narrower. Its grade of workmanship, however, is of the best, but its price is correspondingly less than the CSCO.

The Victor diaphragm is put on the market to meet any kind of competition, its price being very attractive to those wishing a diaphragm of this character. It is made of two-ply cotton belting instead of three-ply, dyed fast black, bound with artificial leather binding and has corner reinforcements.

In connection with its diaphragms, The Curtain Supply Company is furnishing hoods or canopies of asbestos cloth and of other materials. The asbestos material is waterproofed, and, being fire-proof by its very nature, affords perfect protection for the diaphragm, thus greatly increasing its durability and life. The hoods are made long enough to completely cover the top of the diaphragm and reach down a foot or more on either side. These hoods or canopies can be used in connection with any other style of diaphragm on the market.

The company invites a careful inspection and criticism of its diaphragms, and is glad to say that it has sold a number of the diaphragms to the leading railways. It will be glad to take up the matter with any railway in the market, submitting samples and prices.

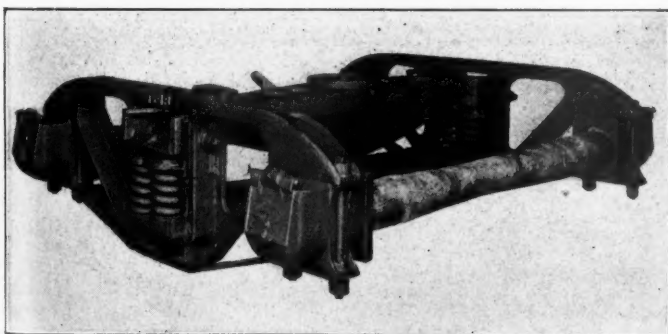
CAST STEEL TRUCK SIDE FRAME AND BOLSTER.

The Gould Coupler Company, Depew, N. Y., shows a cast steel truck assembled, with cast steel truck side frame and truck bolster.

This side frame has a rectangular opening for the bolster, in which opening bolster column guides are inserted similar to the ordinary diamond arrangement. The spring channel or angles are riveted to the base of the column guides, which interlock on the lower portion of the side frame, and their upper portions are secured by lateral bolts. These bolts cannot be lost or misplaced, as they are retained in position by the truck bolster.

This construction provides for flexibility and eliminates the bolster wear on the side frames. These have evenly distributed metal and the tension and compression members are in straight lines, while the portion of the frame over the journal boxes has an exceptional depth for preventing bending and distortion.

The cast steel truck bolster shown with this cast steel truck is of a new and very strong design and particularly



Cast Steel Truck Side Frame, Inset Lid Journal Boxes, U-Type Truck Bolster and New Process Steel Axles.

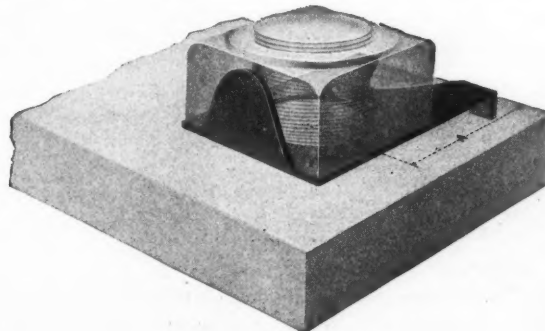
adapted to foundry practice for sound production of the bolsters. Angles and square corners are avoided where at all possible, the design consisting of curves and straight lines.

The bolster has exceptional width at the center plate for lateral strength and a narrow but heavy tension bottom member, allowing extra depth at the center plate without interference with the flanges of the spring channel. This bolster is said to show, under repeated tests, extreme flexibility, exceptional carrying capacity and stability. The design is modified to meet the various requirements as to application to the diversified types of trucks now in service.

A NEW FASTENER.

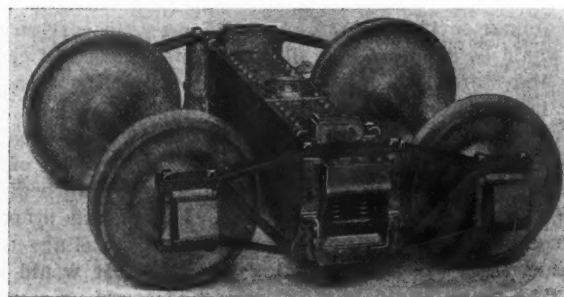
The F. B. C. arch bar nut lock is marketed by the Keystone Nut Lock Company, Pittsburgh, Pa. Its exhibit is with the Flannery Bolt Company (Pittsburgh, Pa.), booth 442.

The fasteners are of simple design, the characteristic features being the corrugated or raised imprints surrounding the bolt hole; these serve as a cushion for the seating of the



F. B. C. Arch Bar Nut Locks.

nut, and allow for irregularities of the nut or bolt head surface. When assembled, the F. B. C. nut lock or fastener has no protruding metal other than its width, equivalent to the square of the nut which spans the arch bar.



Truck with F. B. C. Arch Bar Nut Locks.

Continuous nut locks are also made, embodying the main feature for locking air cylinder bolts and nuts, striking plate bolts and carrier iron bolts.

THE CONSTRUCTION OF NATURAL ICE HOUSES.

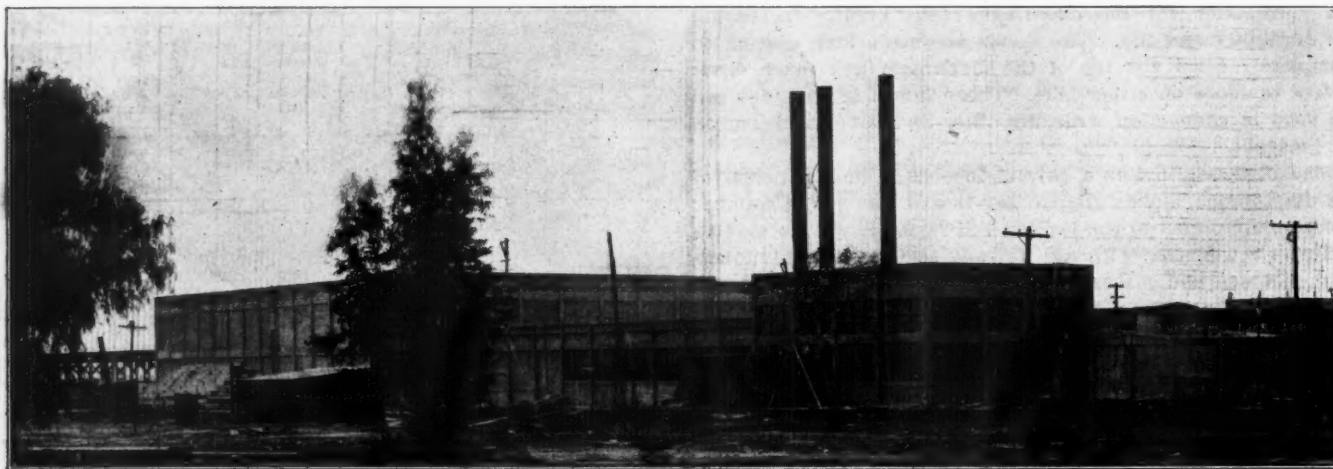
The annual waste of ice by melting while stored in natural ice houses is enormous, and much of this waste is unnecessary. The best natural ice houses suffer losses of more than 30 per cent by melting. This fact is known by statistics gathered from every storer of natural ice in the United States. These statistics also show that the average cost of ice houses runs from \$1.10 to \$2.50 per ton storage capacity. All of the houses showing a cost under \$1.60 per ton are five years old or over, and of course, could not be duplicated now within 35 per cent of the original cost. The average cost of storing natural ice by railways is 60 cents per ton.

The great loss of ice in storage can be reduced, by proper insulation, to less than 7 per cent for a full season, in most cases without materially increasing the original cost of the building. If the storer of natural ice will pay for building his house \$2.00 for every ton of ice stored the shrinkage can be held down to 7 per cent, and at a cost slightly over \$2.00 per ton, the total shrinkage can be kept down to 3 per cent.

That it is very profitable to improve the construction or insulation of these houses can be seen by the following: A 2500-ton storage house at \$1.50 per ton will cost stored, \$3750.

Taking the ice at a cost of 40 cents per ton (which is the lowest cost we have), 2500 tons would originally cost \$1,000. The average meltage in this type of building is 40 per cent. This would mean an annual loss of \$400. If this house were properly built and insulated at a cost of \$1.85 per ton the guaranteed meltage would not exceed 7 per cent. This increase in the initial cost of the structure would amount to \$750, with an insured loss by meltage not to exceed \$70,

Light horizontal concrete beams about 15 feet apart connect the pilasters or columns. The curtain walls are of terra cotta or tile. Waterproof lith board insulation is applied in a continuous and unbroken sheet on the inside of these walls from floor to ceiling. The floor is insulated sufficiently to protect the ice from the higher temperature of the earth, and is pitched toward the center so as to pyramid the ice and provide drainage. The roof of the structure is either frame



Pre-cooling Station of the Santa Fe at San Bernardino.

or an annual saving of \$330. The difference in cost on this basis would be made up in a little over two years. Of course where the stored ice costs more, as it frequently does, the saving is greater.

The method of improved construction and insulation referred to is one that would greatly prolong the life of the building and one which would insure the continuance of the original insulating efficiency for years. In fact, this proposed construction would mean no greater loss by meltage after ten years than when the building was new. It would also mean that there would be no covering of straw or sawdust required over the ice while it is in storage, an antiquated and unsanitary practice.

Some of the large western roads have already begun to reinforce by insulation all of their old houses and have decided to adopt entirely different plans for new work. These roads are the Rock Island, the Union Pacific, the Southern Pacific, the Burlington and several other smaller roads. These companies have employed the Union Fibre Company, Winona, Minn., which makes Waterproof Lith Board Insulation, to reinforce their old houses with this type of insulation.

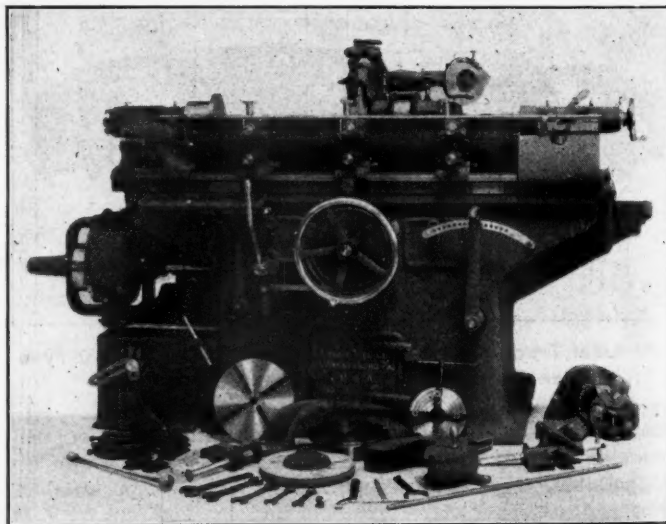
The Union Fibre Company employs a corps of engineers and will be glad to submit plans and sketches to all those interested in the insulation of ice storage houses or cold storage buildings of any kind. The large pre-cooling stations of the Pacific Fruit Express Company at Los Vegas, Nev., and Colton and Roseville, Cal., and the large pre-cooling station of the Santa Fe at San Bernardino, Cal., have been insulated with waterproof lith board by the Union Fibre Company. This insulation is used in fire-proof buildings as well as in wooden buildings. The Union Fibre Company also manufactures Linofelt, which is used largely in the insulation of refrigerator cars. These materials are on exhibition in space 448.

The company says that the ice house of the future will be a fire-proof building which can easily be insulated to keep the annual loss by meltage under 5 per cent and can give the same insulating protection continuously for 20 years without depreciation. A construction which gives all of the advantages of fire-proof construction combined with low first cost is found in a wall construction of reinforced concrete pilasters heavy enough to carry the entire roof structure.

or steel covered with a heavy metal or composition roof. The storage room is cut off with a heavily insulated ceiling at the plate and the insulation of the ceiling joins the wall insulation at the angles.

LANDIS NO. 3 UNIVERSAL GRINDING MACHINE.

This type of grinding machines, made by the Landis Tool Company, Waynesboro, Pa., embodies many new features and improvements, enabling it to produce accurate and highly finished work with rapidity and economy. It combines both an external and internal grinder, and is especially adapted to tool-room service for finishing such work as straight and



Landis No. 3 Universal Grinding Machine.

taper spindles arbors, rolls, male and female gages, dies, reamers, plain, angular and forming milling cutters and a large variety of other work that can be held by either a face-plate or chuck.

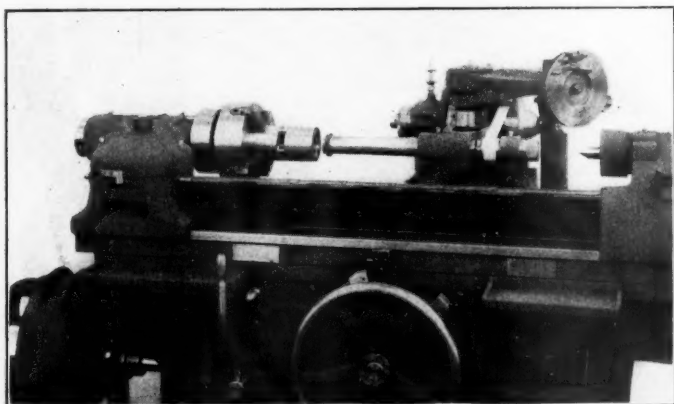
The table swivels for grinding taper, and has two scales graduated in degrees and inches per foot. The headstock

swivels for short abrupt tapers. The spindle revolves for chuck or face-plate work, and is arranged to be locked for grinding on dead centers. The footstock spindle is operated by a hand wheel, and is provided with a variable tension spring, or it may be held rigidly for supporting the center to the work.

The grinding wheel head is of very rigid construction. The slider has long guides with large bearing surfaces, and is arranged to automatically take up any back lash that might occur in the feed gearing, thus preventing any possible jumping in of the wheel when feeding. The spindle is of hardened steel, accurately ground, and runs in self-aligning phosphor-bronze bearings, which are adjustable for wear. A micrometer lateral feed of the spindle is provided, which is useful in grinding shoulders and other similar work. This feature is indispensable for tool work. The entire head swivels on the carriage for taper grinding, and is graduated 90 deg. each side of the center line.

Feeding up of the grinding wheel can be done either automatically or by hand. The grinding wheel travel feed is automatic, and the full range of speed variation is made by the movement of a single lever, requiring no shifting or gearing, clutches or belts. The grinding wheel carries automatically at reversing points, permitting the wheel to grind itself clear at shoulders before reversing, and, if desired, the time of tarry can be varied.

The automatic cross feed of the grinding wheel operates at each reversal of the wheel carriage, and can be set to reduce the diameter of the work from .00025 in. to .005 in.



Near View, Landis No. 3 Universal Grinding Machine.

The grinding wheel truing fixture is quickly placed and clamped wherever required along the table to the position of the wheel. It is adjustable for different sizes of work, which need not be removed while dressing the wheel. The rests support the work at two points—underneath and in front. These supports are adjusted independently of each other, which is essential to perfect grinding. This plan of construction insures the work being ground perfectly round and free of chatter. The countershaft has self-oiling and self-aligning bearings, and is easily installed.

MANUFACTURE OF BRAIDED RUBBER HOSE.

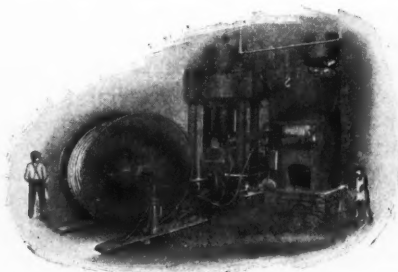
Rubber is derived from the milk found in the bark of certain trees and vines. The best rubber known comes from Brazil and is known as "Up-River Fine Para." The trees are tapped at a certain time of the year and the milk thus procured is coagulated, the rubber rising to the top. This coagulated latex is then wrapped layer upon layer on a paddle, each layer being smoked over a fire. After the rubber has been built up in this manner to a ball convenient for handling, about 6 to 10 in. in diameter, it is packed and shipped, and it is in this shape that the rubber manufacturer gets it. This rubber contains more or less moisture, and quite a little dirt and bark.

In the first step of manufacture of hose by the Electric Hose & Rubber Company, Wilmington, Del., the rubber is washed by being passed several times between heavy corrugated rolls, while streams of water remove the sand, earth and vegetable substances that are exposed by the tearing action of the rolls. After washing, it is dried. This was formerly done by hanging the rubber in a warm room, but at present the vacuum dryer is used. After the rubber has been dried, it is then mixed with certain ingredients in the



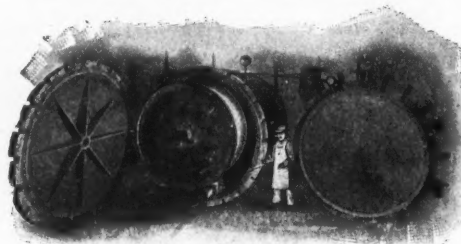
Braiding Machine.

form of powders, which are kneaded into the rubber, only such ingredients being used as are suitable for the purpose for which the hose is intended. After the rubber is mixed, it is fed through a tubing machine and comes out in the form of a long seamless tube. This tube is made in long lengths and is coiled in pans. The tubing is then put through the braiding machine, shown herewith, each machine holding 48 or more separate bobbins. On each bobbin is wound a



Lead Press.

single cord of seine twine, which is very strong, being made of numerous strands of cotton twisted together. The machines, which are automatic, braid the cord circularly around the rubber tubes. If there is a defective piece of yarn, the breaking of the yarn will stop the machine. Each fabric is seamless, and each strand is independent of the



Steam Vulcanizer.

other, yet these brands completely encircle the hose and make a stronger fabric than of any other construction, being the same principle of a hemp rope.

Between each layer of fabric there is put one of rubber and the hose thus built up until it is of the required thickness. After the hose has been made of the desired thickness it is then passed through the lead press shown in the

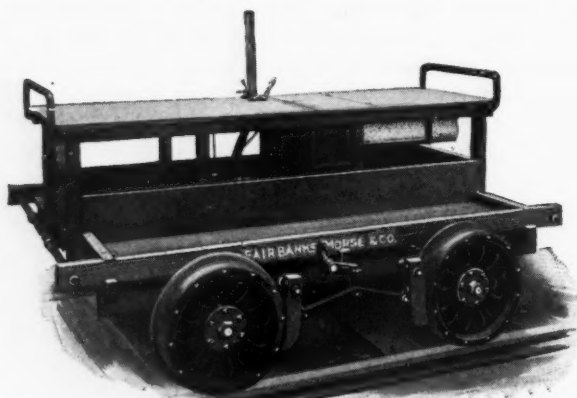
illustration. The hose and pipe are taken up on large iron drums, and as the pipe is made continuous the hose can be made in long lengths, without splice or joint. After the iron drum is filled with the pipe containing the hose a heavy pressure is put on the inside of the hose and locked in, and the whole transferred to the steam vulcanizer shown. It is kept in this vulcanizer for a time, and the liquid inside of the hose expands and forces the rubber up through the meshes of the cotton, uniting rubber with rubber through the cotton, making the hose a homogeneous mass. The hose is vulcanized by the action of sulphur which is kneaded into the rubber in the mixing operation. It is the action of sulphur in the vulcanizing process which sets the rubber and makes it a commercial article. After the hose has been vulcanized the iron reel containing the pipe, hose, etc., is immersed in water, which stops vulcanization. When the hose is sufficiently cooled the pipe is removed, the hose examined for imperfections and is ready for marketing.

GASOLENE SECTION MOTOR CARS.

The new types of motor cars at the exhibit of Fairbanks, Morse & Company, Chicago, are attracting considerable attention, as they show progress and the adaptability of the gasolene engine. The laboring men in most all branches of work have gradually been helped by the application of machinery; but the section laborer on a railway has long been compelled to bend his back and perhaps strain his muscles against a head wind, when going to work in the morning; work all day, and then another hard pump back home. The Fairbanks, Morse & Company section motor cars are intended to change this condition.

The No. 26 type of car, shown herewith, is a straight motor car with a two-cylinder engine, direct connected to rear axle, the crank shaft being integral with the rear axle of the car. The seat is raised a proper height above the deck and runs longitudinally with the car, having capacity for 10 or 12 men. The weight is little more than a standard hand car and four men can lift it off the rails. From seven or eight up to 30 miles per hour can safely be made with this car. The engine is direct connected to rear axle, with enclosed dust proof crank case. The lubrication is taken care of by mixing oil with gasolene.

The No. 12 car, from the rear, resembles a standard lever car; but a side or front view shows a single cylinder engine,



Fairbanks, Morse Gasolene Section Car.

located just in front of the gallows frame, direct connected to the car by a pinion on the extended engine shaft which drives a gear inside of the 20-in. pressed steel car wheel. The engine can be disconnected and the car propelled by hand, but when the car is operated by the engine, the hand lever is thrown out of gear and locked in position. The engine on this No. 12 is the same type as on the No. 26.

After a thorough trial, a western line arranged to equip

an 85-mile branch with No. 12 cars, which figures will result in saving as follows:

Present force with eight hand cars.
8 sections—1 foreman and 4 men on each.
Wages—laborers, \$1.40 per day, 32 men, 30 days.... \$1,344.00 per month.
8 foremen, \$55.00 per month.. 440.00

\$1,784.00 "

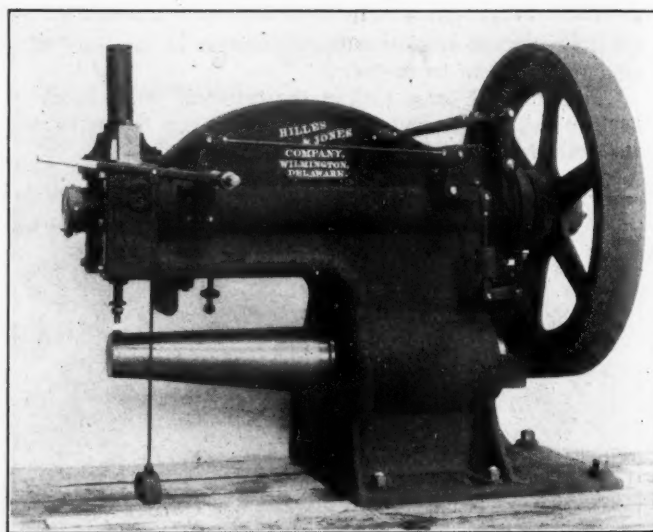
With section motor cars.
5 sections—1 foreman and 5 men on each.
Wages—laborers, \$1.40 per day, 25 men, 30 days.... \$1,050.00 per month.
5 foremen, 30 days..... 275.00

\$1,325.00 "

Actual saving in pay roll per month 459.00

RIVETING AND PUNCHING MACHINE.

The accompanying photograph illustrates a high-speed riveting and punching machine, with the riveting tools in position. This type of machine, made by Hilles & Jones Company, Wilmington, Del., has recently been adopted by steel passenger car builders and it is capable of heading



Hilles & Jones Riveting and Punching Machine.

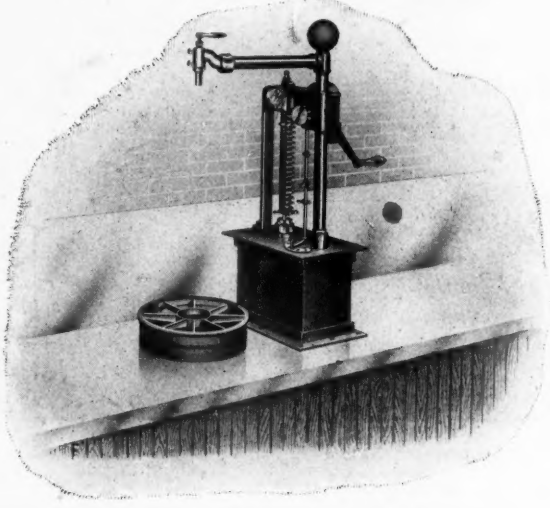
rivets up to $\frac{3}{8}$ -in. in diameter cold, and punching a $\frac{3}{4}$ -in. hole in a 5-16-in. plate. The die is held in forged steel stake which is keyed through the frame of the machine. The speed is 65 strokes per minute and the sliding head is controlled by an automatic clutch so that the head stops automatically after each blow, or can be run continuously when the hand lever or foot treadle is held down. On account of the high speed of the machine, it is necessary to supply a band brake on the front end of the eccentric shaft to make a quick stoppage on the shaft. This machine is also used for cylindrical work.

OIL STORAGE SYSTEMS.

An important consideration in connection with the oils used by railways for illumination, fuel and lubrication is the opportunity for economical and convenient handling afforded by the storage tanks, pumps, meters, etc., manufactured to suit almost any condition by S. F. Bowser & Company, Inc., Fort Wayne, Ind. The equipments of this firm are so favorably known that a large number of the railways in the United States and Canada are now using some kind of a bowser oil handling device. The company has made some interesting installations during the past year.

Thirty-five rectangular tanks, some of 10,000 gals. capacity,

form the nucleus of a splendid equipment for storing and distributing oils, installed at the Topeka shops of the Atchison, Topeka & Santa Fe. It is one of the largest of its kind in existence, and an inspection will be found both interesting and instructive by railway men interested in the safest and most efficient time and labor-saving devices for handling oils. No expense has been spared to make this equipment as perfect as possible, insuring safety from fire and explosion, a clean, evaporation and leak-proof storage, and a quick, easy and accurate distribution through Bowser self-measuring

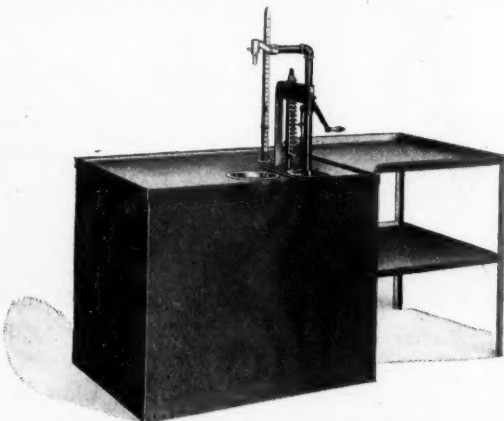


Long Distance Self-Measuring Pump.

pumps, of the long distance type, located near the distributing counter in the store room. While the smaller pumps are operated by hand, the larger ones, used for barreling different kinds of oils, are power pumps.

The Seaboard Air Line and the Baltimore and Ohio R. R. have also increased their oil handling facilities by installing complete Bowser equipments at Jacksonville, Fla., and Benwood Junction respectively. Both equipments are complete and are of the highest order in every respect. The B. & O. outfit is very similar to the Bowser equipment previously installed for this railway at the Union Station in Washington, D. C.

A new installation, and larger than the Santa Fe equipment as far as the number of units is concerned, is being placed by one of the great Canadian railway systems which

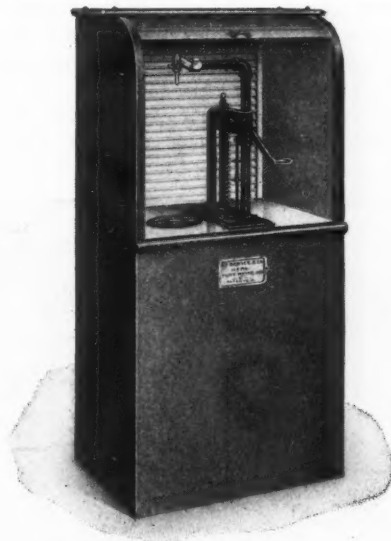


Railway Table Oil Tank.

has recently ordered 63 Bowser self-measuring long distance pumps for use at different stations on its western division.

A start has been made by the C. B. & Q. towards equipping its oil supply cars with Bowser tanks, pumps, etc. One of its cars which has been so equipped is in service distributing oils to various stations and is proving greatly superior to the older methods.

Six oil houses belonging to the Western Pacific recently equipped with Bowser systems are said to be proving excellent investments, as will also the equipments recently



Roll Top Steel Oil Cabinet.

furnished to the Sunnyside yard of the Pennsylvania Tunnel and Terminal Co., New York, and to the Vandalia at Terre Haute, Ind.

CAR SEAT COVERING.

There has been rapid and interesting progress made in the manufacture of car seat covering, and after many years of trying a variety of materials, it is quite generally considered that plush cannot be surpassed in appearance and durability. Mohair plush, as made by the Massachusetts Mohair Plush Company, Boston, Mass., is said to be a very natural and satisfactory fabric. It is cleanly, and has a surface which is smooth and glossy, presenting no clinging surface for dust. Although dust settles in the bottom of the fabric, it does not get out until the cloth is beaten or cleansed. Plush is easily cleaned, lasts long, endures harsh treatment and stands up under cleansing and redyeing. While it is difficult to sit still on a smooth surface, the adherence of the pile fabric of mohair plush seems actually to add comfort to a journey.

METHODS OF THE DEARBORN DRUG & CHEMICAL WORKS.

The fact that there are very few waters used for steam purposes in which the kinds and quantities of solid matter contained are alike is said to have been thoroughly understood by the chemists who originated the Dearborn methods, and their purpose from the outset was to inaugurate a system whereby the differences in waters could be determined, and the effects in steam boilers noted. Pursuing the subject further along chemical lines they were enabled to understand the cause of many troubles experienced in practice, and to demonstrate by actual experiment the correctness of their deductions, by the comparison of the kinds and quantities of solid substances contained in the water with the results actually obtained.

While waters being used in different plants may be obtained from the same source, it is seldom that the waters as they enter the boilers are alike, due to the use of heaters, purifiers, or both, or mixture with condensation in varying quantities. All of these factors affect the nature of the waters and change the kinds and quantities of the substances which they carry, so that they differ from the original supply and also from each other, when they enter the boilers.

The Dearborn Company's first step was to establish a

scientific department, having at its command complete laboratories for the analyses of water and scale, and for doing the necessary analytical work to enable the scientific department, with this information and that regarding the operating conditions of the plant under consideration, to reach definite conclusions as to the best method of overcoming the feed-water troubles.

The Dearborn laboratories are supervised by thorough analysts especially trained for this class of work. Having

than is usually conceded. It is therefore necessary to maintain a separate and individual department for each, the personnel of the stationary department made up of those conversant with stationary practice, and the railway department of those who are thoroughly conversant with the conditions under which the water is used and is to be handled, in both cases assisted by the scientific and analytical departments.

The method of applying the treatment in any case has

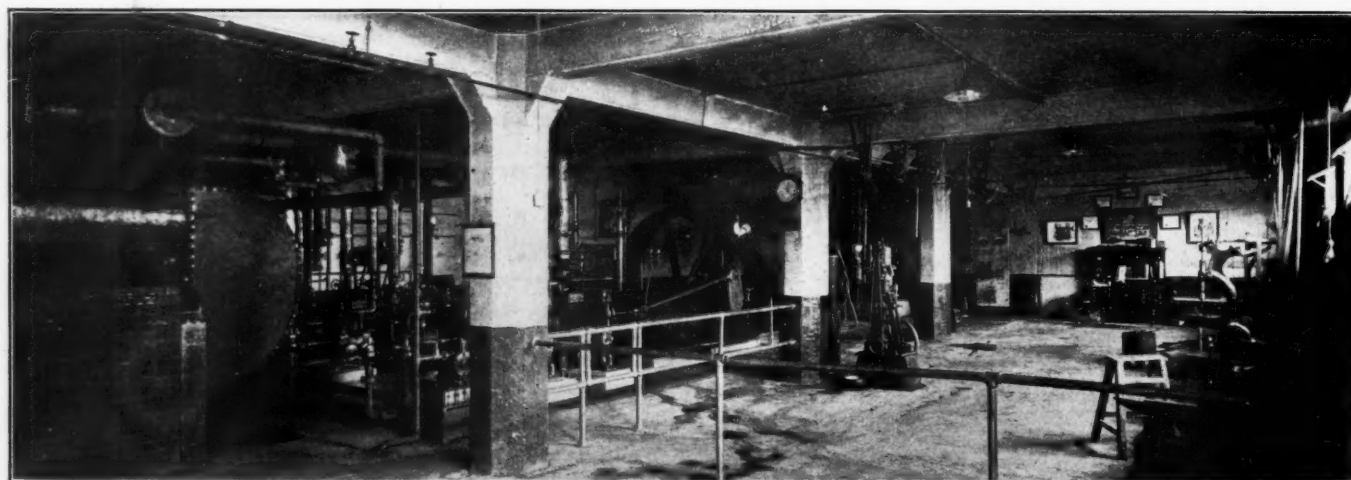


Loading Platform, Dearborn Factory.

demonstrated from the beginning the original theory that it was necessary to furnish preparations of different composition for waters carrying different kinds and quantities of solid matter, the company has worked along this line strictly, analyzing the water in all cases, and often the scale as well, and obtaining all the information possible regarding the total of which covers the reagents in the formula for the finished product in the same proportionate amount as the different substances exist in the water.

much to do with the results actually obtained, consequently this often considered trivial matter must be given careful consideration. The method of procedure in treating locomotive feed-water is as follows:

Samples of waters are analyzed, and the preparations made to suit the conditions as shown by these analyses. The treatment is applied direct to the water in the locomotive tender, no separate treating plant being necessary. Trouble caused from scale, pitting, and corrosion is overcome by



Power and Engine Room, Dearborn Factory.

There are several different sets of conditions which must be considered in this work. For example, the treatment of waters in stationary boilers constitutes one phase of the the operating conditions under which the water is used. One substance is considered at a time, and the necessary amount of the particular reagent each demands determined, subject; those used in locomotive boilers another, and those in boilers for other purposes still another. All of these require special consideration, as the conditions under which the water is used have a very much greater effect or bearing

applying the treatment at terminals only, while for that caused by priming or foaming, a preparation is made that is applied each time the water supply in the tender is replenished. Experienced engineers are furnished to install the treatment and instruct all concerned in the proper use of it.

The treatment prevents scale formation, pitting and corrosion, materially extending the life of flues and fireboxes and, due to clean boilers, does much toward economy in fuel consumption. The wear and tear of valve gears, cylinder, packing, etc., is also reduced.